ELECTRONIC CROSSOVER NETWORK

D-23

SERVICE MANUAL

PIONEER®

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1. SPECIFICATIONS

Semiconductors

Transistors 71
Diodes 18

Amplifier Section

Circuitry
- Buffer Amplifier . . . . . Pure complimentary SEPP.
- Filter . . . . . RC passive filter (6dB/oct., 12dB/oct.)
  RC activer filter + RC passive filter (18dB/oct.)
  2-way, 3-way, 4-way

Cut-off Frequency
- LOW (HIGH CUT)
- MID-LOW (LOW CUT) . . 63, 80, 100, 125, 160, 200, 250, 320, 400, 500, 630Hz
- MID-LOW (HIGH CUT)
- MID-HIGH (LOW CUT) . 320, 400, 500, 630, 800, 1k, 1.25k, 1.6k, 2k, 2.5k, 3.2kHz
- MID-HIGH (HIGH CUT)
- HIGH (LOW CUT). 1.6k, 2k, 2.5k, 3.2k, 4k, 5k, 6.3k, 8k, 10k, 12.5k, 16kHz

Slope . . . . . 6dB/oct, 12dB/oct, 18dB/oct.
LEVEL Control . . . . . 0 to −30dB (1dB step), ∞ left and right channel individual controls
Insertion Loss . . . . . 0 to −2dB
Input Impedance 50kΩ
Output Impedance . . . . . 4kΩ (Max.)
Output (R_L: 50k) . . . . . 1V, 10V (Max.)
Total Harmonic Distortion 20Hz to 20,000Hz
- 1V output 0.005%
- 10V output 0.1%

Frequency Response
- (LOW END, HIGH END) 10Hz, 100,000Hz $^{+0dB}_{-1dB}$

Hum and Noise (IHF, short-circuited, A network)
- 1V output 100dB

Miscellaneous

Power Requirements . . . . . 110V, 120V, 220V and 240V (Switchable), 50/60Hz
Power Consumption . . . . . 14 watts (UL)
Dimensions . . . . . 420(W) x 150(H) x 352(D) mm
16-9/16 x 5-29/33 x 13-7/8 in.
Weight — Without package: 8.7kg (19lb 3oz)
With package: 9.7kg (21lb 6oz)
AC outlets . . . . . 1 (UNSWITCHED)

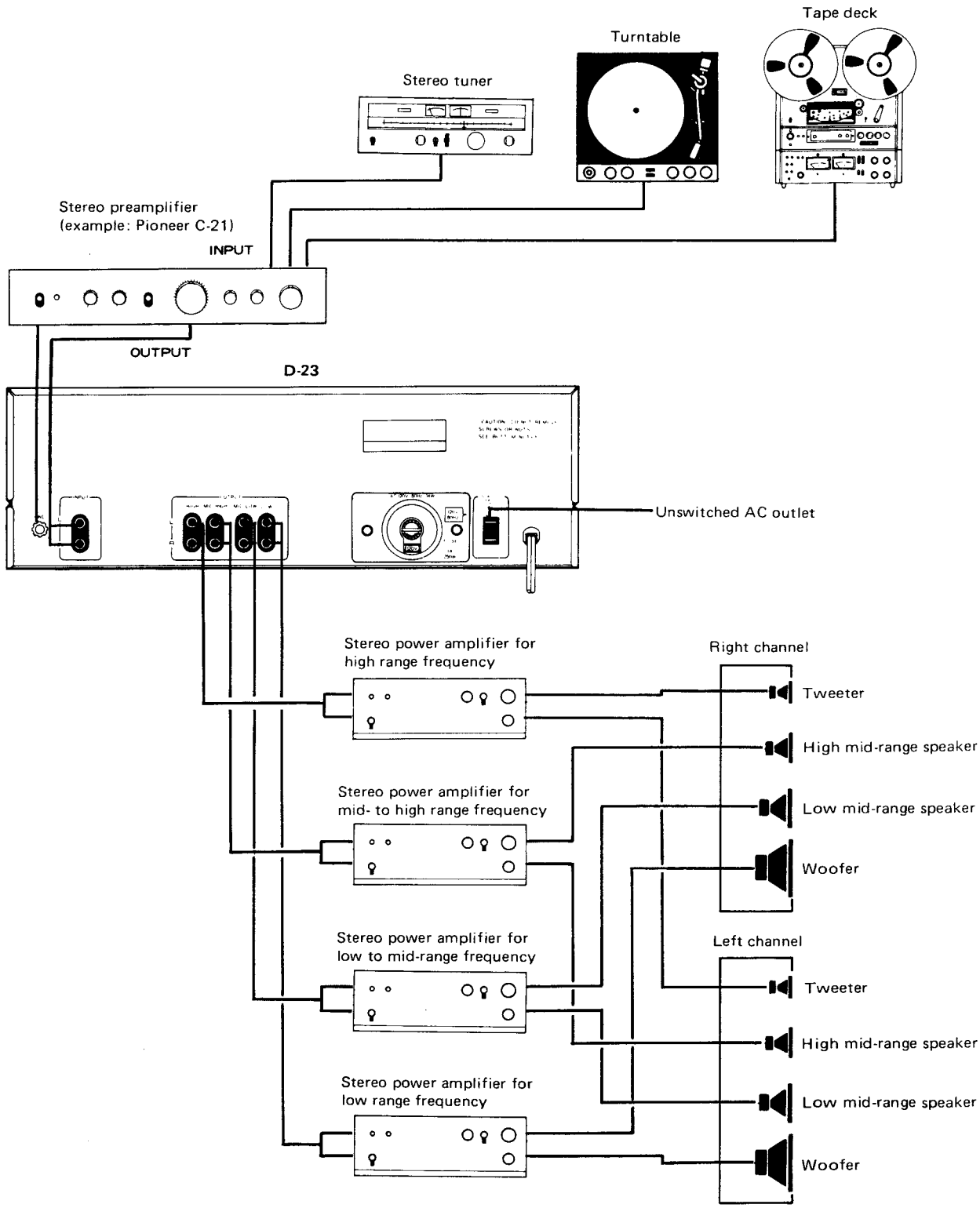
Furnished Parts

Connection Cord with Pin Plugs 4
Operating Instructions 1
Hex. Wrench (used for fastening knob) 1

NOTE:
Specifications and the design subject to possible modification without notice due to improvements.

2. CONNECTION DIAGRAM

(FOR 4-WAY AMPLIFIER SYSTEM)

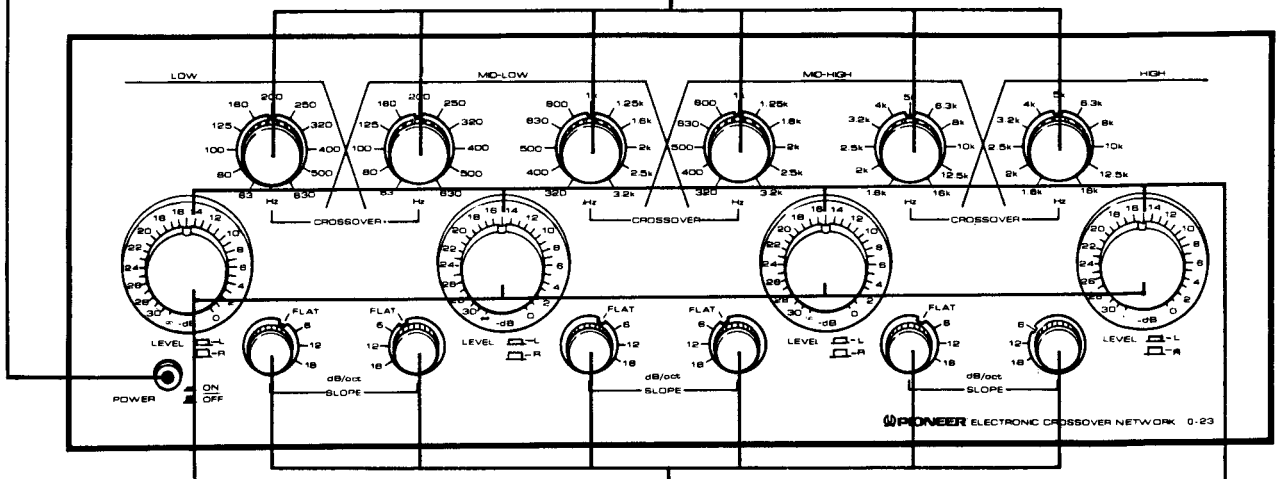


3. FRONT PANEL FACILITIES

POWER SWITCH (WITH PILOT LAMP)

The push ON power switch incorporates a built-in muting circuit to suppress the generation of any noise during the switching action. Consequently, no sound will be heard during the first few seconds after turning the power ON.

FREQUENCY SELECTOR CONTROLS (See below)



LEVEL CONTROLS

(LOW, MID-LOW, MID-HIGH, HIGH)

These controls are for adjusting output levels of each frequency range. Left and right channels are adjusted independently.

MEMORY MARKERS

These markers will prove very useful in marking pre-selected levels for comparison purposes and other fine adjustments.

SLOPE SELECTOR CONTROLS (See below)

FREQUENCY SELECTOR AND SLOPE SELECTOR CONTROLS

Crossover frequencies between each frequency range are determined by the cut-off frequencies in each range and the selected slope for each of these frequencies. Cut-off frequencies are selected by the frequency selector controls along the top row, while slope characteristics are selected by the slope selector controls along the bottom row. But if any slope selector control is set to FLAT, the cut-off frequency selected by the corresponding frequency selector control will become irrelevant, resulting in a flat frequency response across all frequency ranges.

LOW LP*: Control for selection of slope and cut-off frequency at upper limit of low range frequency (LOW). (See Fig. A).

MID-LOW HP*: Control for selection of slope and cut-off frequency at lower limit of low to mid-range frequency (MID-LOW). (See Fig. B).

MID-LOW LP: Control for selection of slope and cut-off frequency at upper limit of low to mid-range frequency (MID-LOW). (See Fig. C).

MID-HIGH HP: Control for selection of slope and cut-off frequency at lower limit of mid-to high range frequency (MID-HIGH). (See Fig. D).

MID-HIGH LP: Control for selection of slope and cut-off frequency at upper limit of mid-to high range frequency (MID-HIGH). (See Fig. E).

HIGH HP: Control for selection of slope and cut-off frequency at lower limit of high range frequency (HIGH). (See Fig. F). Note that this slope selector control has no FLAT position.

*LP: Low-pass filter
HP: High-pass filter

NOTE:
If the tweeter and mid-range speakers receive signals whose frequencies are below their respective lower limits, rupture of those speakers may result. Therefore, be especially careful when switching the slope selector controls, particularly when selecting the FLAT position.

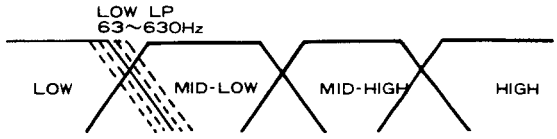


Fig. A

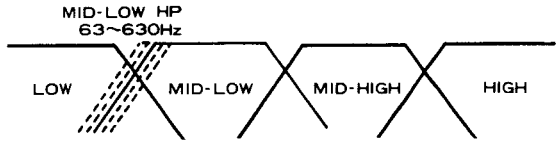


Fig. B

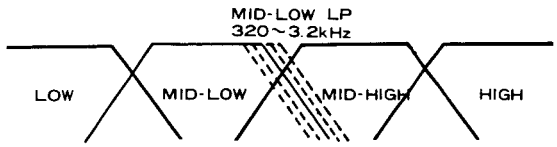


Fig. C

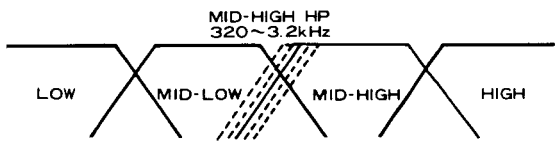


Fig. D

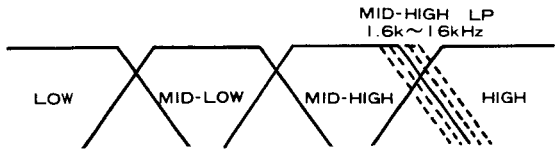


Fig. E

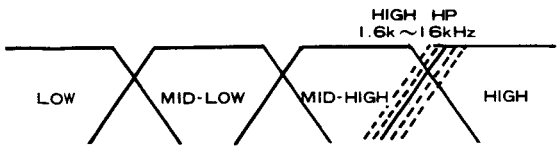


Fig. F

CUT-OFF FREQUENCY

Theoretically, the cut-off frequency is the point at the start of the two finely drawn lines in Fig. G.

In the D-23, the actual characteristics are shown by the dotted line (Fig. H) and the broken line (Fig. G). So the cut-off frequency corresponds to −3dB when the slope selector is set to −6, or −18dB/oct, and −6dB when it is set to −12dB/oct.

SLOPE

Slope refers to the amount of attenuation in the frequency response curve per octave (1 octave corresponds to a doubling, or halving of the frequency).

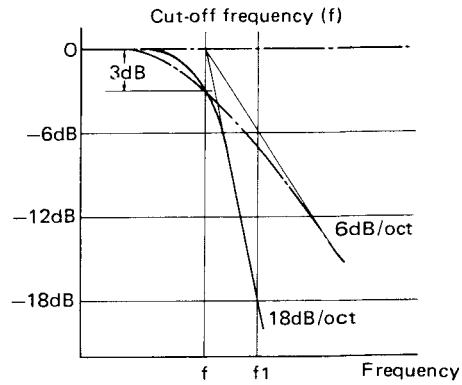


Fig. G

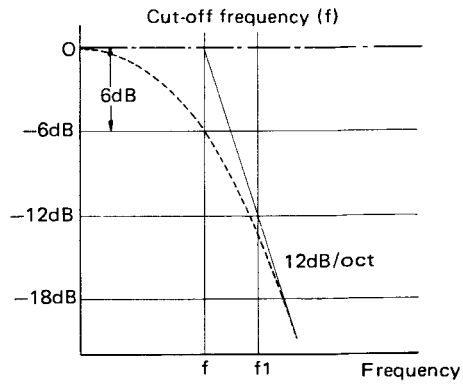
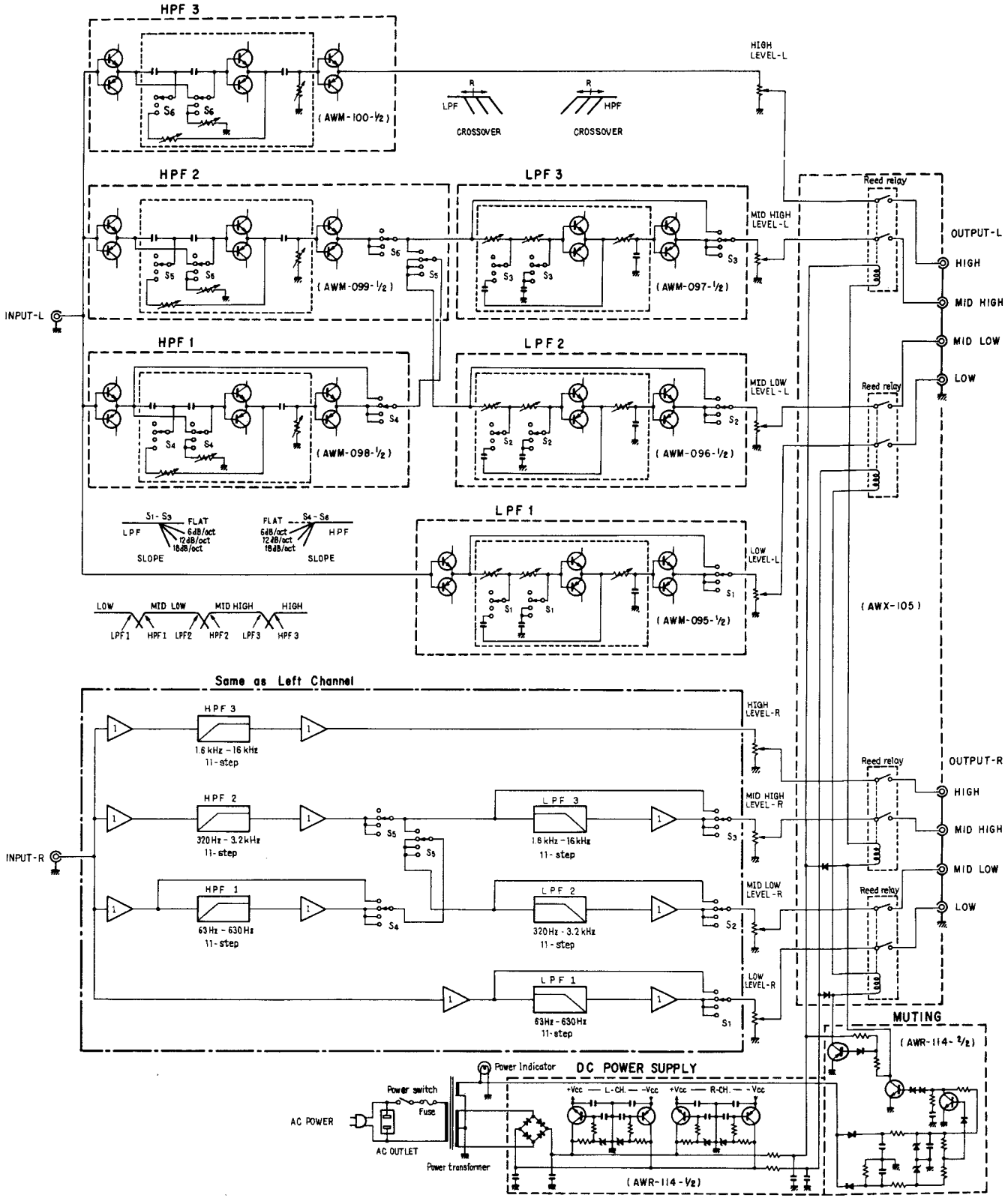


Fig. H

4. BLOCK DIAGRAM



5. CIRCUIT DESCRIPTIONS

D-23 is an electronic crossover network which divides the audio frequencies for a multi-channel amplifier system. Its block diagram is given on page 6.
The filter circuits have the same construction for both the L and R channels.
The SLOPE switch and CROSSOVER switch are ganged for both the L and R channels.
The LEVEL control can be independently operated for the L channel and R channel.

5.1 FILTER CIRCUIT

Buffer Amplifier

An NPN transistor and PNP transistor Class A pure complementary SEPP circuit such as that illustrated in Fig. 1 is employed.

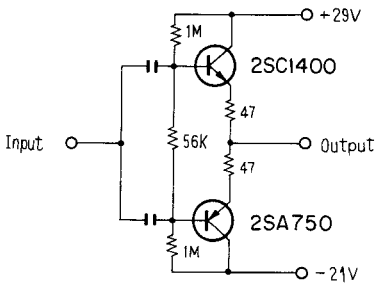


Fig. 1 Buffer amplifier

This circuit is used as the filter input/output buffer and as a feedback type filter amplifier (gain = 1). Since an emitter-follower circuit is used, its input impedance is high and output impedance is low. Consequently, the impedance is not disturbed by the front and back stages so the external equipment connected and the filter characteristic is not effected.

High Pass Filter (H.P.F.)

The H.P.F. is shown in Fig. 2. BA1 — BA3 in the figure are the previously mentioned buffer amplifiers. VR1 is an 11 steps attenuator which switch the roll-off frequency and S1 is the slope characteristic selector switch.
The MID-LOW, MID-HIGH and HIGH frequency channels H.P.Fs. have different C1, C2 and C3 capacitances and different wiring at FLAT, but are otherwise basically the same.
When S1 is set to the FLAT position at the MID-LOW channel, the signal only passes through BA1 and bypasses the filter element.
Since the MID-HIGH channel H.P.F. is not connected at FLAT, the signal does not pass through this H.P.F. In this case, the output of the MID-LOW channel H.P.F. is connected to the MID-HIGH channel L.P.F. and the signal is not applied to the MID-LOW channel L.P.F. (See the block diagram on page 6.).
The HIGH channel does not have a FLAT position. When S1 has been set to the 6dB/oct position, An RC 1-stage attenuation-type H.P.F. such as that illustrated in Fig. 3 is formed. In this case, the slope characteristic is attenuated 3dB at fc (roll-off frequency) and 6dB at 1/2fc.
When the switch has been set to the 12dB/oct position, an RC 2-stages attenuation-type H.P.F. such as that shown in Fig. 4 is formed and the slope characteristic is attenuated 6dB at fc and 12dB at 1/2fc.

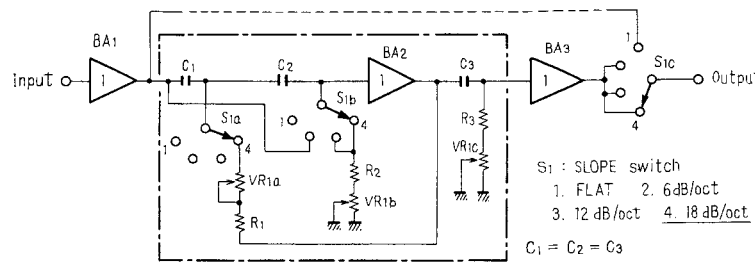


Fig. 2 High pase filter

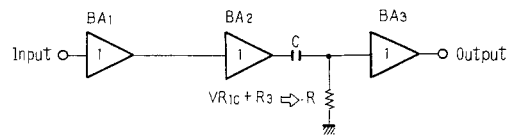


Fig. 3 6dB/oct H.P.F.

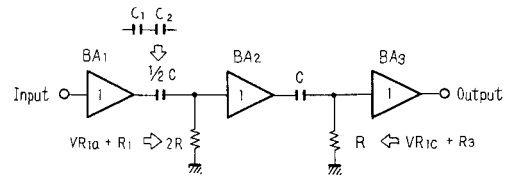


Fig. 4 12dB/oct H.P.F.

When S_1 is set to the 18dB/oct position, an RC feedback-type H.P.F. such as that shown in Fig. 5 is formed and the slope characteristic is attenuated 3dB at fc and 18dB at 1/2fc.
This circuit is composed of an emitter-follower circuit to which an RC feedback circuit has been added and positive feedback applied near fc. This improves the knee characteristic of the RC attenuation-type filter by producing a peak at the frequency response near fc.
The slope characteristic is given in Fig. 6.

NOTE:
The ratio of R and C of Figs 2 ~ 5 is the theoretical ratio. Actually, the values of R and C differ somewhat from the theoretical ratio because of the effect of the input and output impedances before and after the filter element.

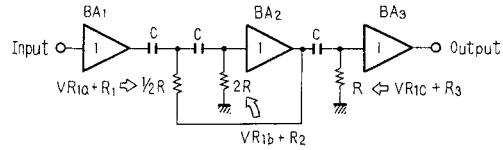


Fig. 5 18dB/oct H.P.F.

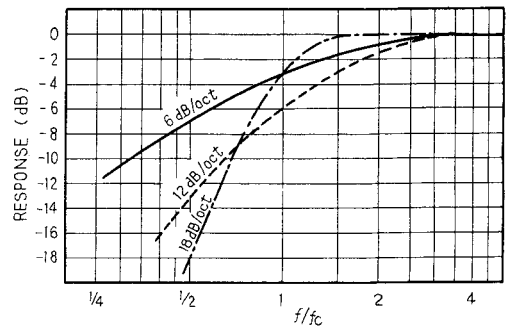


Fig. 6 Slope characteristics for 6, 12 and 18dB/oct H.P.F.

Low Pass Filter (L.P.F.)

The construction of the L.P.F. is shown in Fig. 7. BA1 — BA3 in the figure are the buffer amplifiers previoulsy mentioned. VR1 is an 11-steps attenuator which switch the roll-off frequency. S1 is the slope characteristic selector switch.

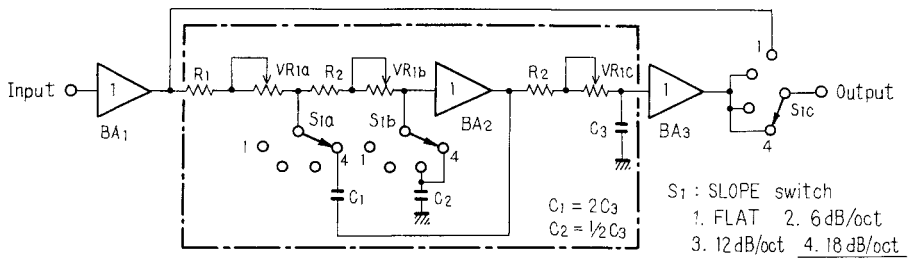


Fig. 7 Low pass filter

The capacitances of C1, C2, and C3 of the LOW, MID-LOW and MID-HIGH frequency channels L.P.Fs. are different. Otherwise, the filters are fundamentally the same.
The H.P.F. input or output buffer amplifier in the MID-LOW and MID-HIGH channels L.P.Fs. corresponds to BA1
When S1 is set to the FLAT position, the signal only passes through BA1 and bypasses the filter element.
When S1 is set to the 6dB/oct position, an RC 1-stage attenuation type L.P.F. such as that illustrated in Fig. 8 is formed. In this case, the slope characteristic is attenuated 3dB at fc and 6dB at 2fc.
When the switch is set to the 12dB/oct position, an RC 2-stages attenuation-type L.P.F. such as that shown in Fig. 9 is formed and the slope characteristic is attenuated 6dB at fc and 12dB at 2fc.

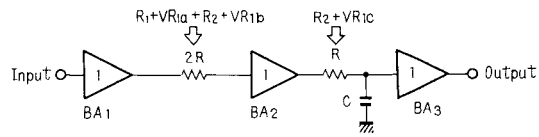


Fig. 8 6dB/oct L.P.F

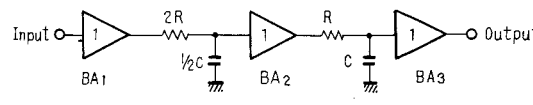


Fig. 9 12dB/oct L.P.F.

At the 18dB/oct position, the RC feedback-type L.P.F. shown in Fig. 10 is formed and the slope characterisitc is attenuated 3dB at fc and 18dB at 2fc.
The slope characteristic is given in Fig. 11.

NOTE:
The ratio of R and C of Figs. 7 ~ 10 is the theoretical ratio. Actually, the values of R and C differ somewhat from the theoretical ratio because of the effect of the input and output impedances before and after the filter element.

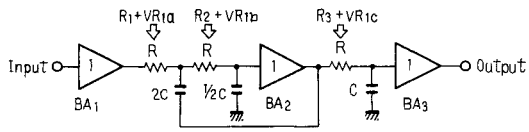


Fig. 10 18dB/oct L.P.F.

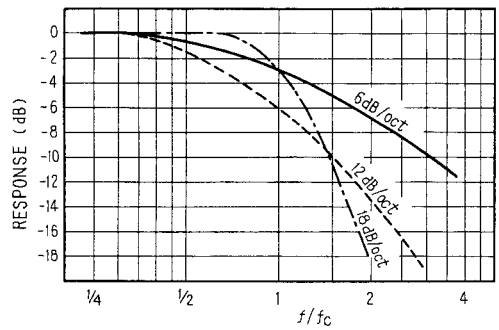


Fig. 11 Slope characteristics for 6, 12 and 18dB/oct L.P.F.

5.2 MUTING CIRCUIT

This circuit cuts the unnecessary sound by opening the output circuit by means of reed relays for several seconds after the power switch has been set to the ON position and immediately after the power switch has been set to the OFF position.
Its circuit construction is shown in Fig. 12.

• Muting when power switch is turned ON

When the power switch has been set to the ON position, the resistance divider (R4, R5) between the positive power supply (+6V) and negative power supply (—6V) divided the voltage at point Ⓐ to —1V. Since Q1 is, therefore unbiased, it remains in the OFF state. Because Q1 is in the OFF state, the voltage of point Ⓑ slowly rises according to the time constant of R6, R7 and C3. When the voltage of point Ⓑ reaches +1.8V, base current flows in Q2 via D6, D7 and Q2 is turned ON. The base of Q3 is biased by the divider R8, R9 between —46V and the collector of Q2 via D8. When Q2 is in the OFF state, the voltage of point Ⓒ becomes +4V, base bias is not applied to Q3 and Q3 is therefore turned OFF.
When Q2 is turned ON, the voltage of point Ⓒ becomes —1.2V, base current flows in Q3 and Q3 is also turned ON.
When both Q2 and Q3 are ON, current flows in RL1 — RL4, the output circuit is closed and normal operation begins.

• Muting immediately after power switch is turned OFF

Since the time constant of the negative power supply (—6V) is shorter than that of the positive power supply (+6V), the negative power supply becomes 0V before the positive power supply immediately after the power switch has been set to the OFF position. Consequently, Q1 is forward biased by the positive power supply (+6V) and is turned ON.
Since this causes the Q1 collector voltage to drop to about 0V, Q2, Q3 are turned OFF, current no longer flows in RL1 — RL4 and the output is opened.
Moreover, since the charge across C3 is instantaneously discharged when Q1 is turned ON, the muting operation is performed even if the power switch is again set to the ON position.

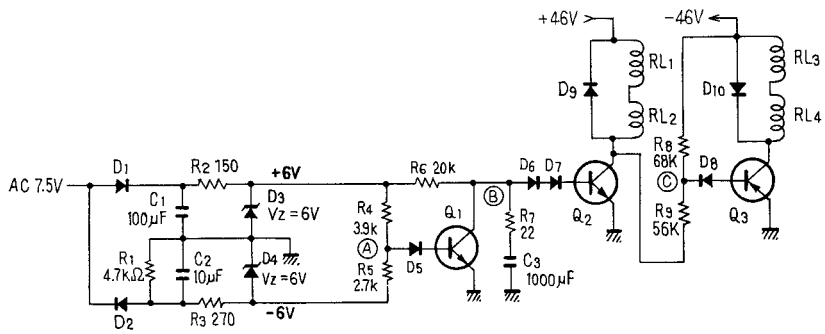


Fig. 12 Muting circuit.

5.3 POWER SUPPLY CIRCUIT

A bridge rectifier circuit is used to produce ±52V DC voltages. These DC voltages are passed through an RC ripple filter and used to drive the muting relay and are also dropped to +29V, −21V through a constant voltage circuit and supplied to the buffer amplifiers. A separate constant voltage circuit is provided for the L channel and R channel.
The ±6V for muting control is supplied by rectifying the voltage from the pilot lamp winding and regulating it with a Zener diode.

5.4 CROSSOVER FREQUENCY RESPONSE

A filter circuit which varies the frequency response not only changes the response, but also changes the phase.
A network having a 6dB/oct slope characteristic shows a phase change such as that illustrated in Fig. 13. At the crossover frequency (f = fc), the L.P.F. side lags 45° and the H.P.F. side leads 45°. This is shown as a vector diagram in Fig. 14a~e. In order to make the frequency response flat when the L.P.F. and H.P.F. outputs are combined, the vector sum at each frequency should be constant. At the crossover frequency, from Fig. 14c, the L.P.F. output and H.P.F. output are $1/\sqrt{2}$ and this becomes −3dB.

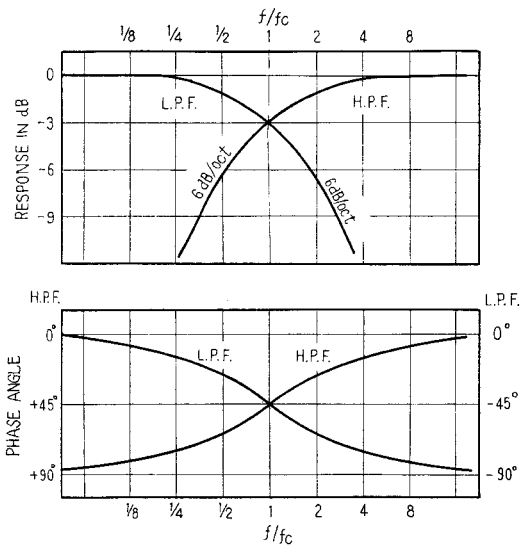


Fig. 13 Phase characteristic for 6dB/oct filter

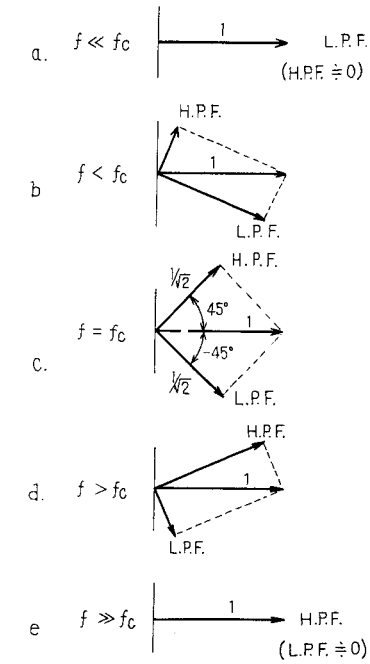


Fig. 14 Vector diagram for 6dB/oct filter

A network having a slope characteristic of 12dB/oct shows a phase change such as that illustrated in Fig. 15. This is shown as a vector diagram in Fig. 16a~e.
At the crossover frequency (f = fc), the L.P.F. lags 90° and the H.P.F. side leads 90°. In this case, if the L.P.F. side or H.P.F. side is made the opposite phase, the respective output levels will become 1/2. In short, the L.P.F. output and H.P.F. output at the crossover frequency will become −6dB.

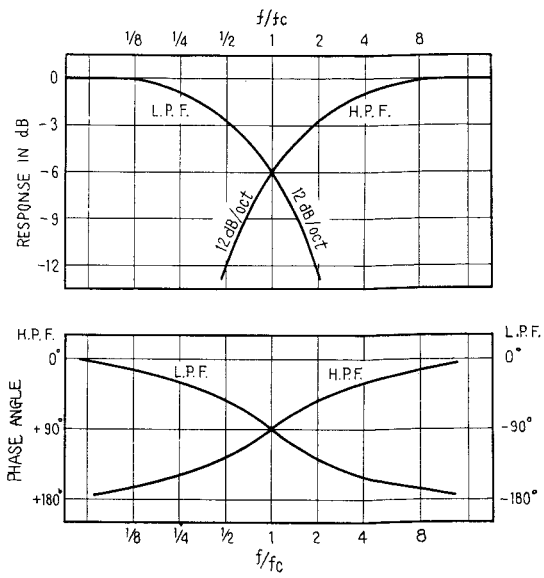


Fig. 15 Phase characteristic for 12dB/oct filter

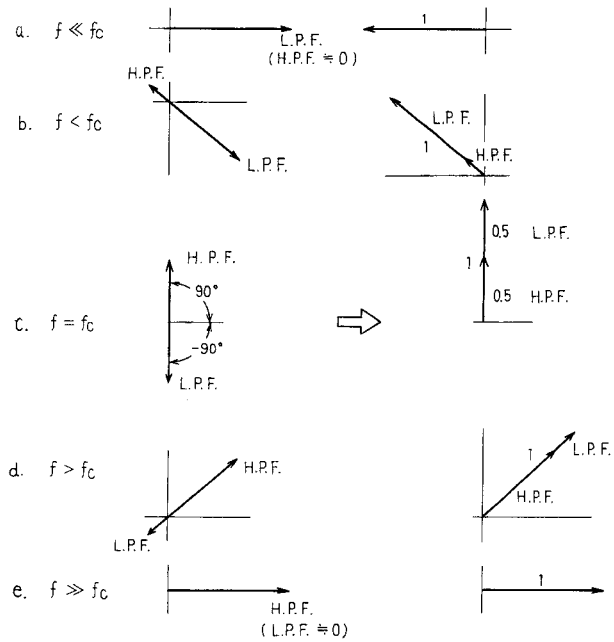


Fig. 16 Vector diagram for 12dB/oct filter

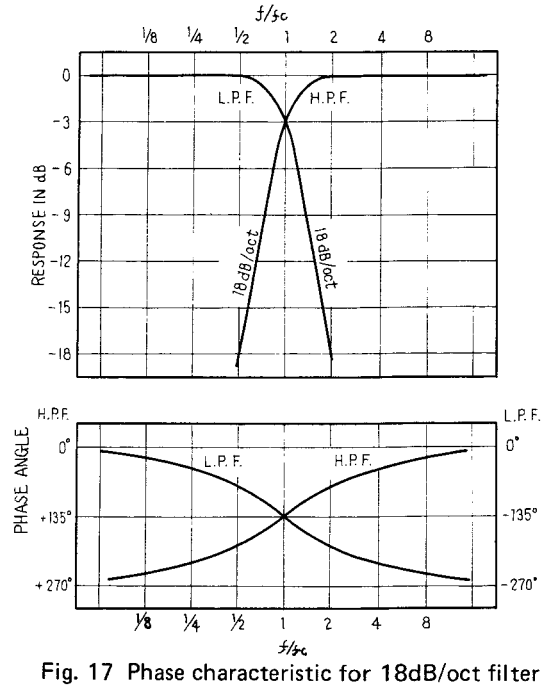


Fig. 17 Phase characteristic for 18dB/oct filter

In an 18dB/oct network, the phase changes further and becomes as shown in Fig. 17. This is shown as a vector diagram in Fig. 18a~e.
At the crossover frequency (f = fc), the L.P.F. side is lagging 135° and the H.P.F. side is leading 135°. From Fig. 18c, the L.P.F. output and H.P.F. output at the crossover frequency should be $1/\sqrt{2}$. This is −3dB.
However, the above is for when the two outputs are combined electrically. Actually, sinee the sound pressure is synthesized by a speaker, the phases are not necessarily matched in space.

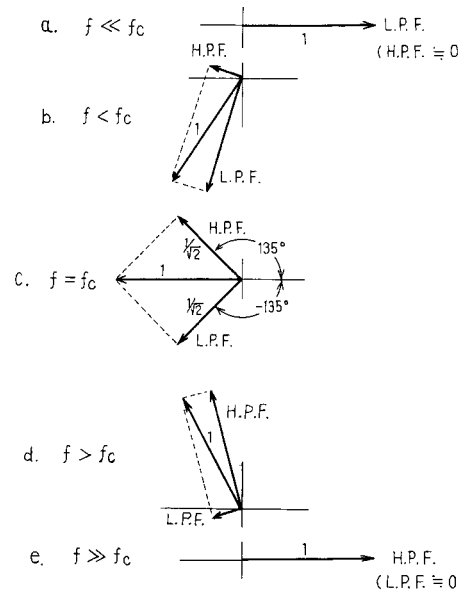


Fig. 18 Vector diagram for 18dB/oct filter

6. DISASSEMBLY

Bonnet case

Remove the 2 screws (A) at both sides of the bonnet case and lift off the case. (See Fig. 19)

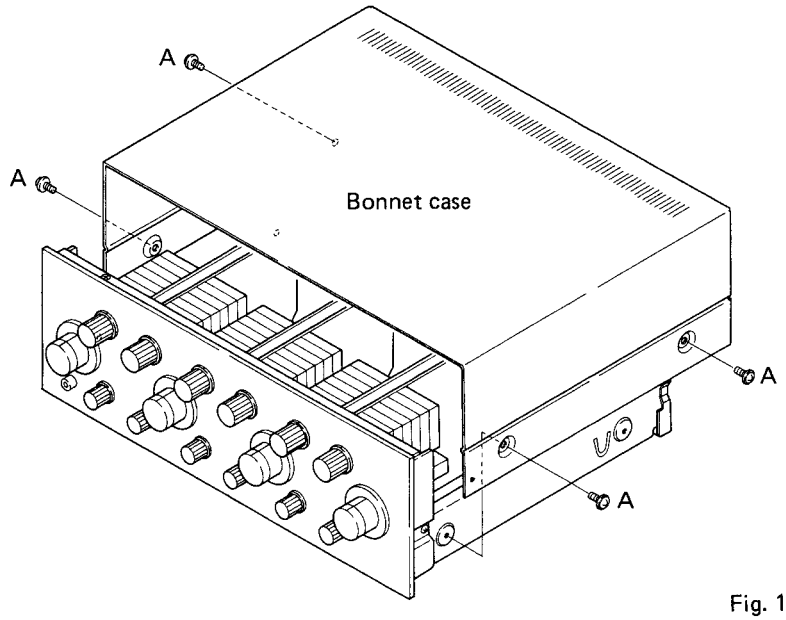


Fig. 19

Bottom plate

Remove the 8 screws (B) at the bottom plate and lift off the bottom plate. (See Fig. 20)

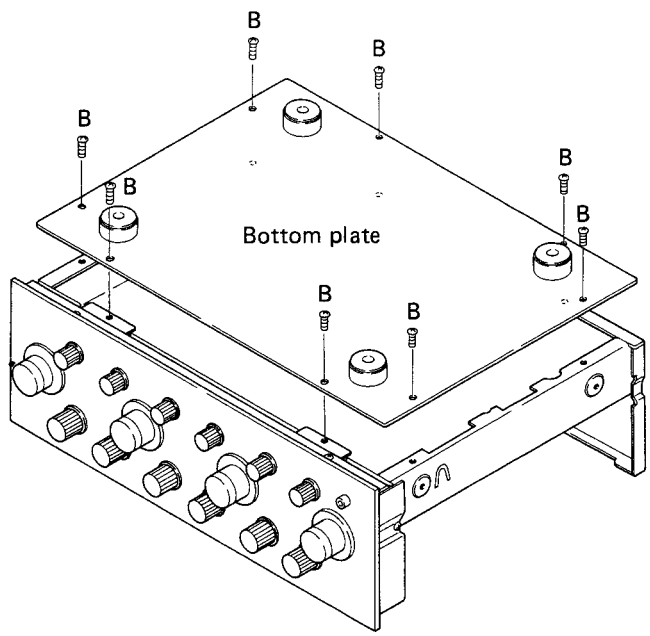


Fig. 20

Front panel

Loosen the set screws of the eight LEVEL knobs (C) with an hexagonal wrench and remove all the knobs, except the POWER switch knob.
Remove the four screws (D) at the top and bottom of the front panel. (See Fig. 21)

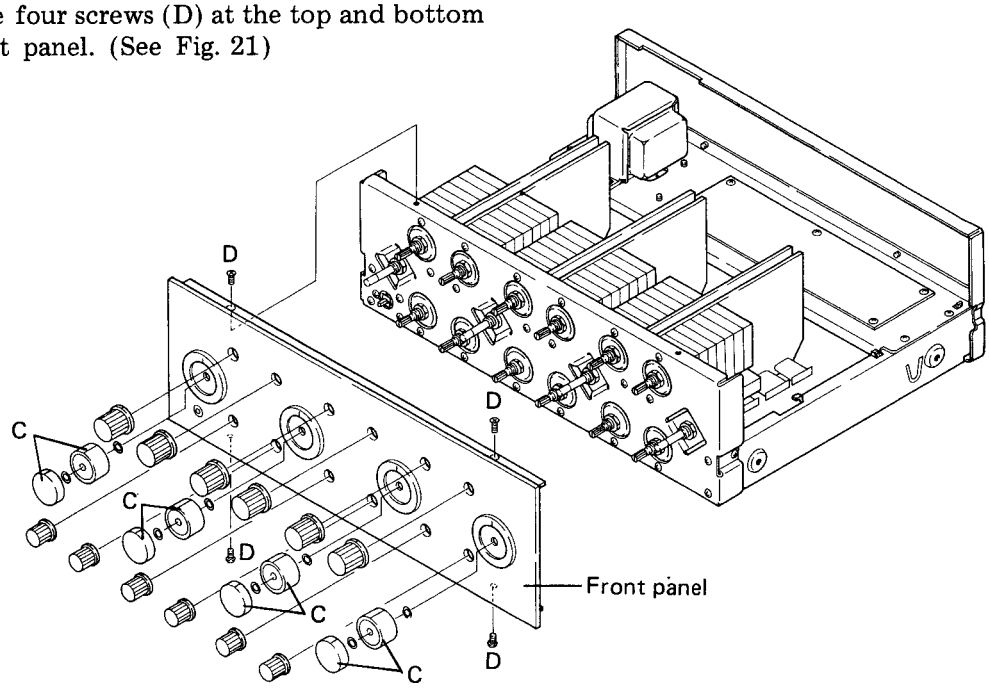


Fig. 21

Filter Assembly

Disconnect the connection cord, remove the 3 screws (E) fastening the filter assembly to the panel stay and remove the assembly (See Fig. 22).

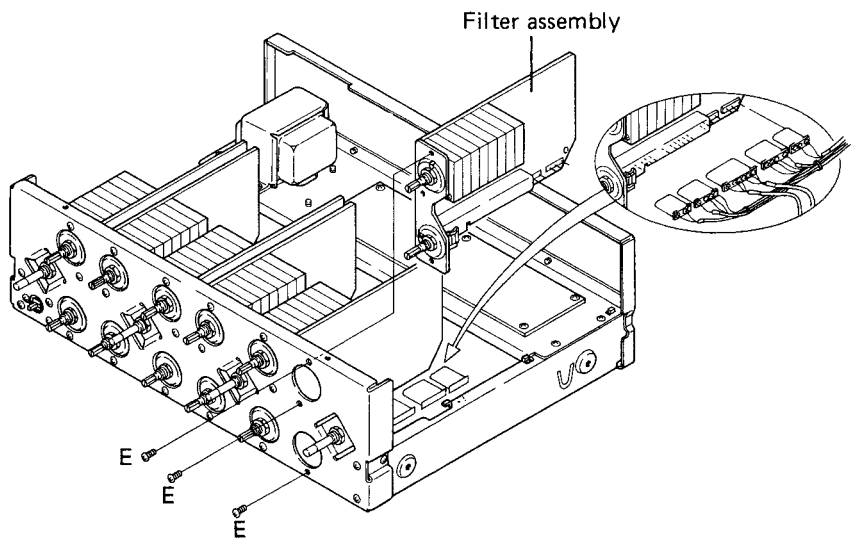
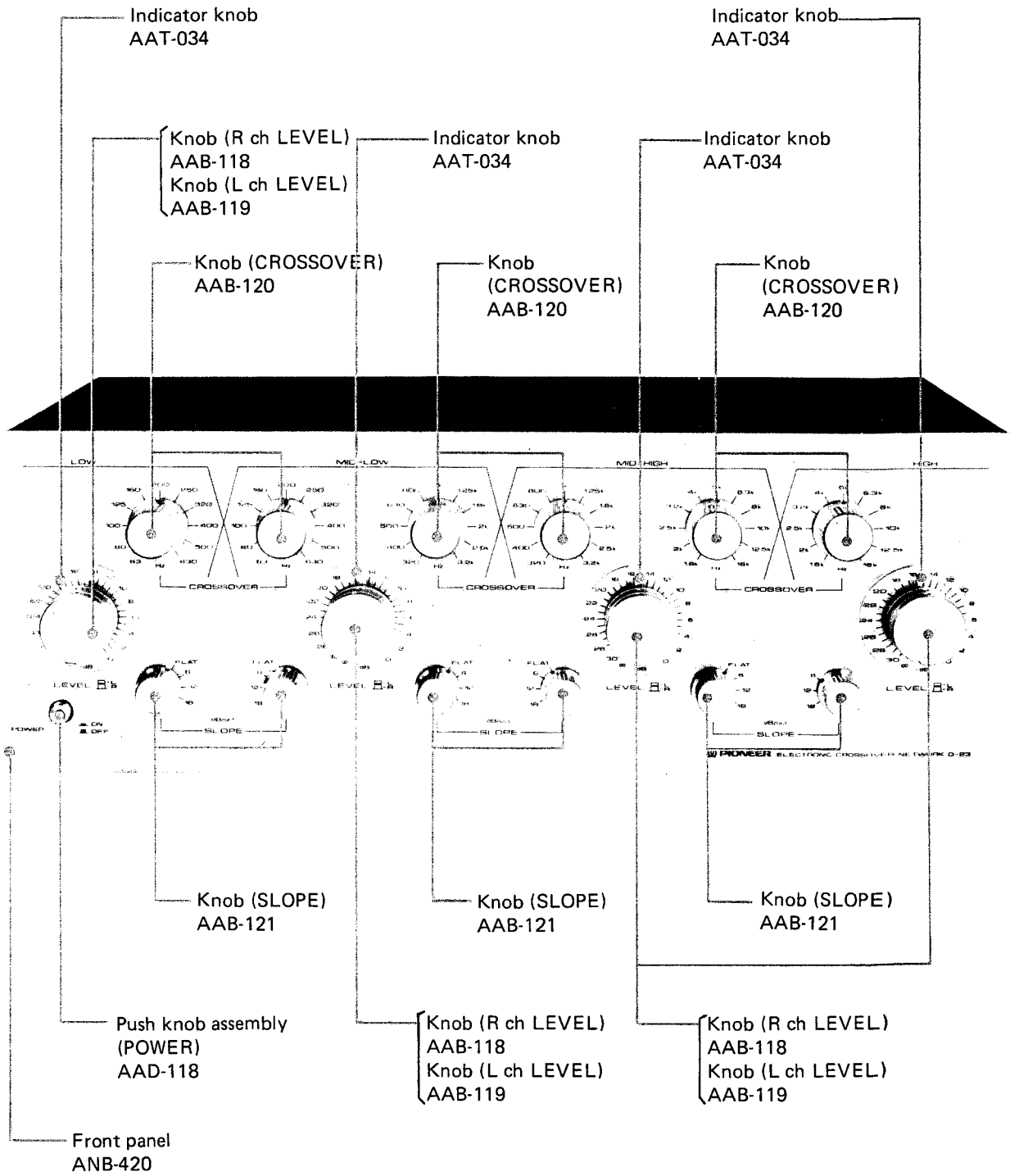


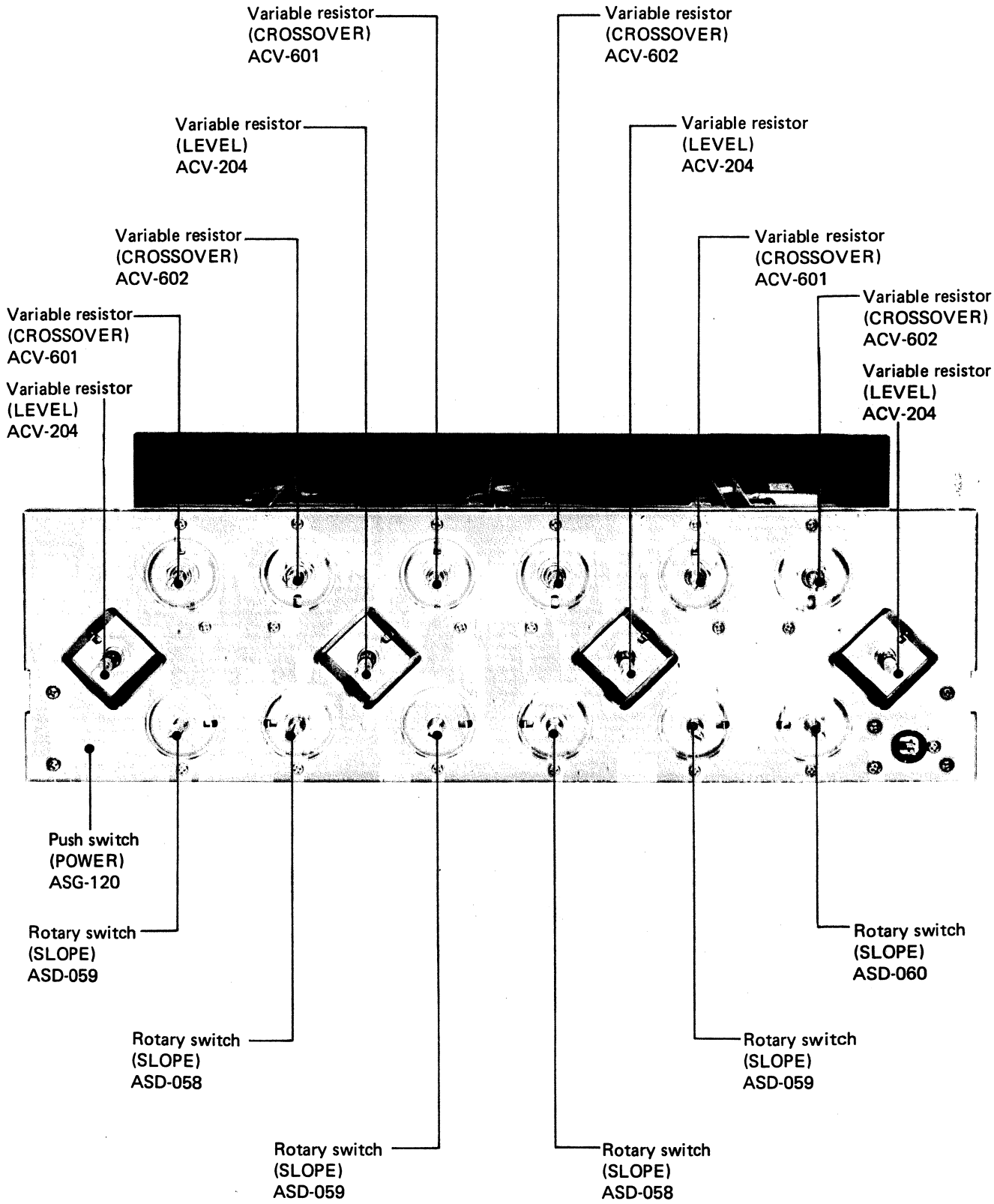
Fig. 22

7. PARTS LOCATION

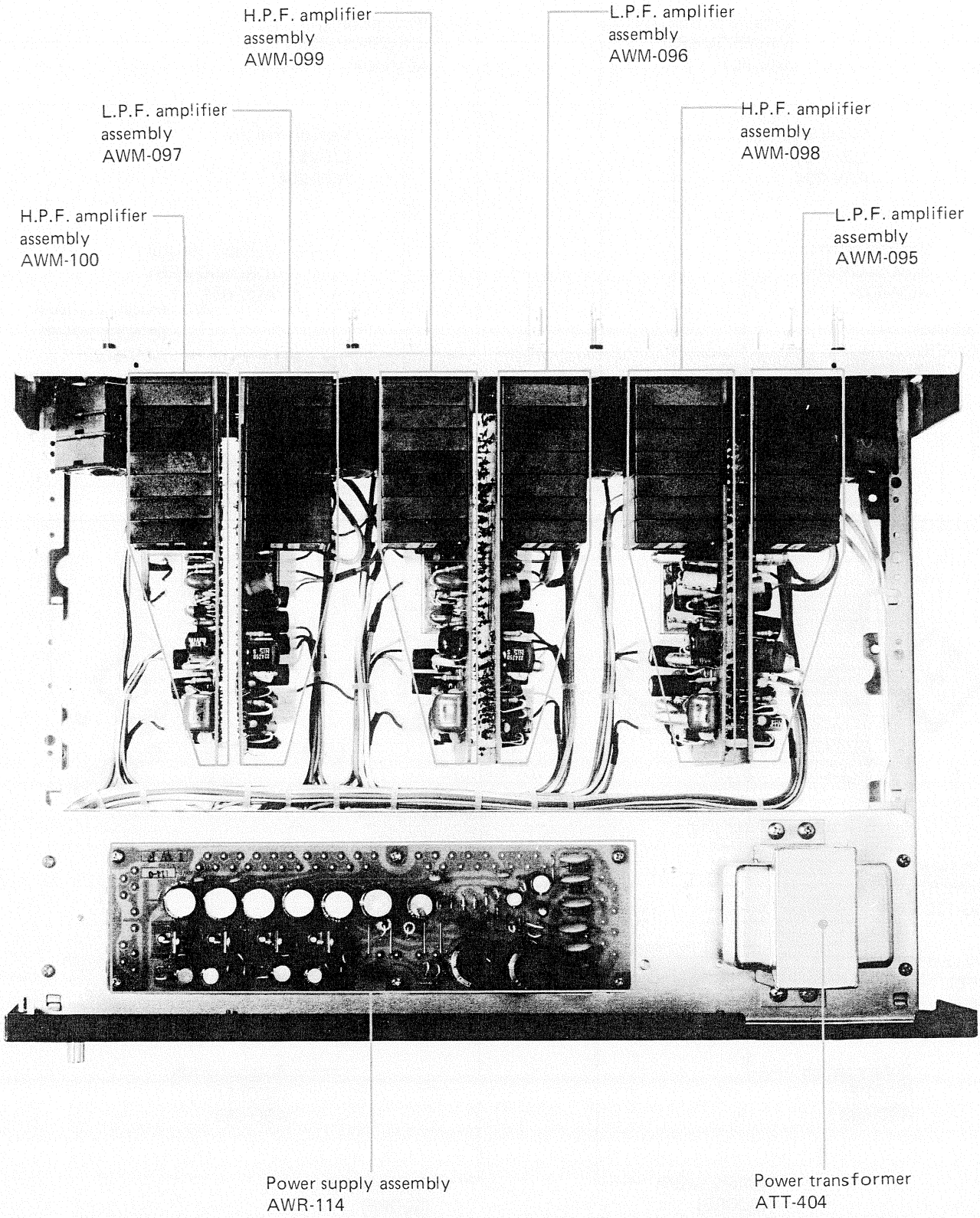
7.1 FRONT PANEL VIEW



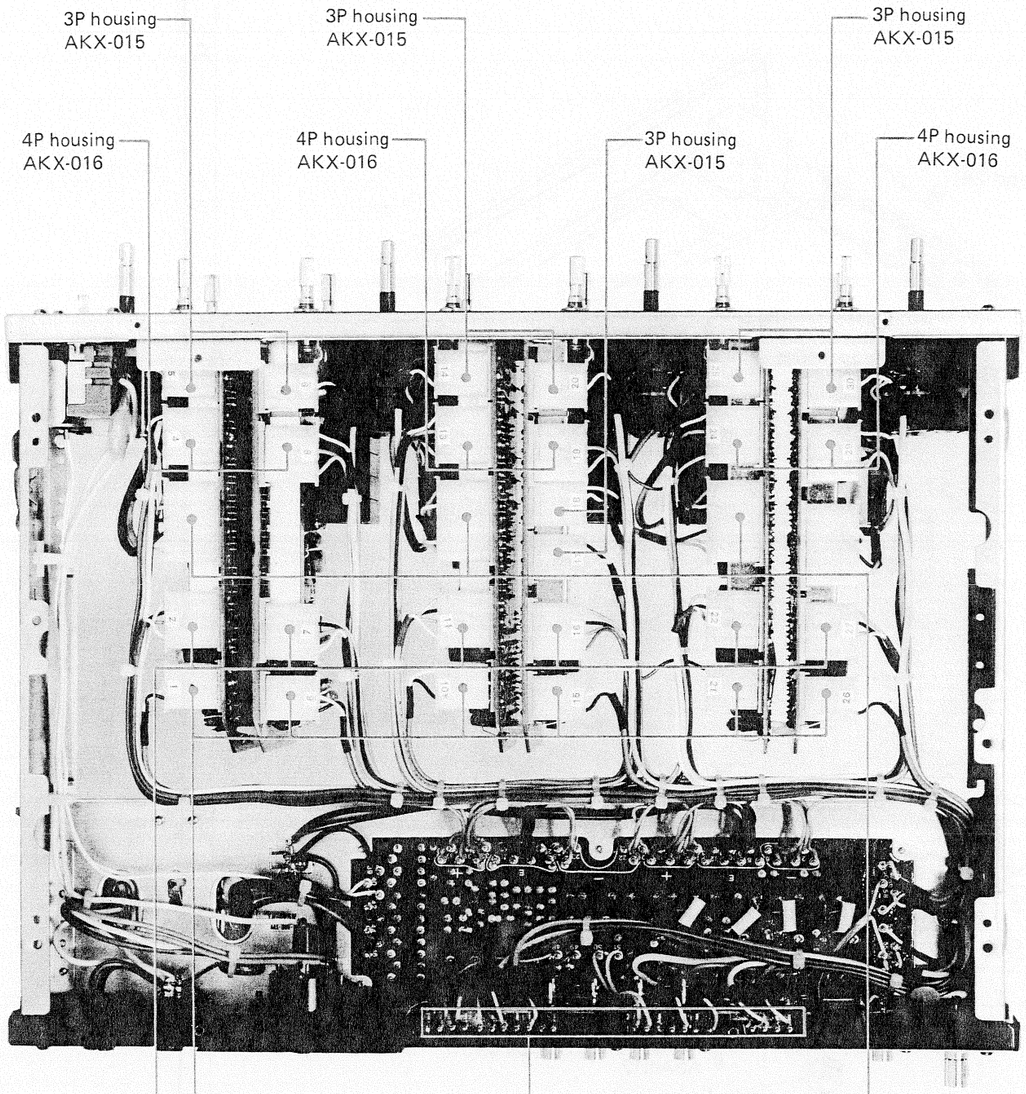
7.2 FRONT VIEW WITH PANEL REMOVED


Variable resistor (CROSSOVER) ACV-601
Variable resistor (CROSSOVER) ACV-602
Variable resistor (LEVEL) ACV-204
Variable resistor (LEVEL) ACV-204
Variable resistor (CROSSOVER) ACV-602
Variable resistor (CROSSOVER) ACV-601
Variable resistor (CROSSOVER) ACV-601
Variable resistor (CROSSOVER) ACV-602
Variable resistor (LEVEL) ACV-204
Variable resistor (LEVEL) ACV-204
Push switch (POWER) ASG-120
Rotary switch (SLOPE) ASD-059
Rotary switch (SLOPE) ASD-060
Rotary switch (SLOPE) ASD-058
Rotary switch (SLOPE) ASD-059
Rotary switch (SLOPE) ASD-059
Rotary switch (SLOPE) ASD-058

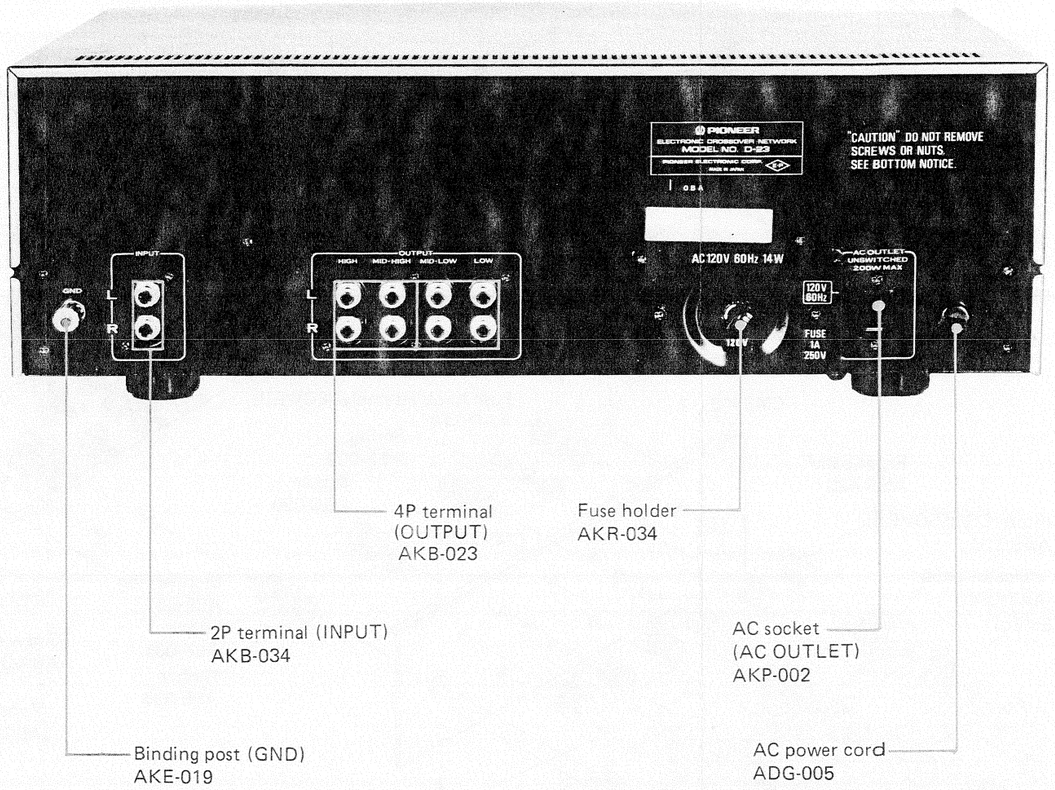
7.3 TOP VIEW


H.P.F. amplifier assembly AWM-099
L.P.F. amplifier assembly AWM-096
L.P.F. amplifier assembly AWM-097
H.P.F. amplifier assembly AWM-098
H.P.F. amplifier assembly AWM-100
L.P.F. amplifier assembly AWM-095
Power supply assembly AWR-114
Power transformer ATT-404

7.4 BOTTOM VIEW



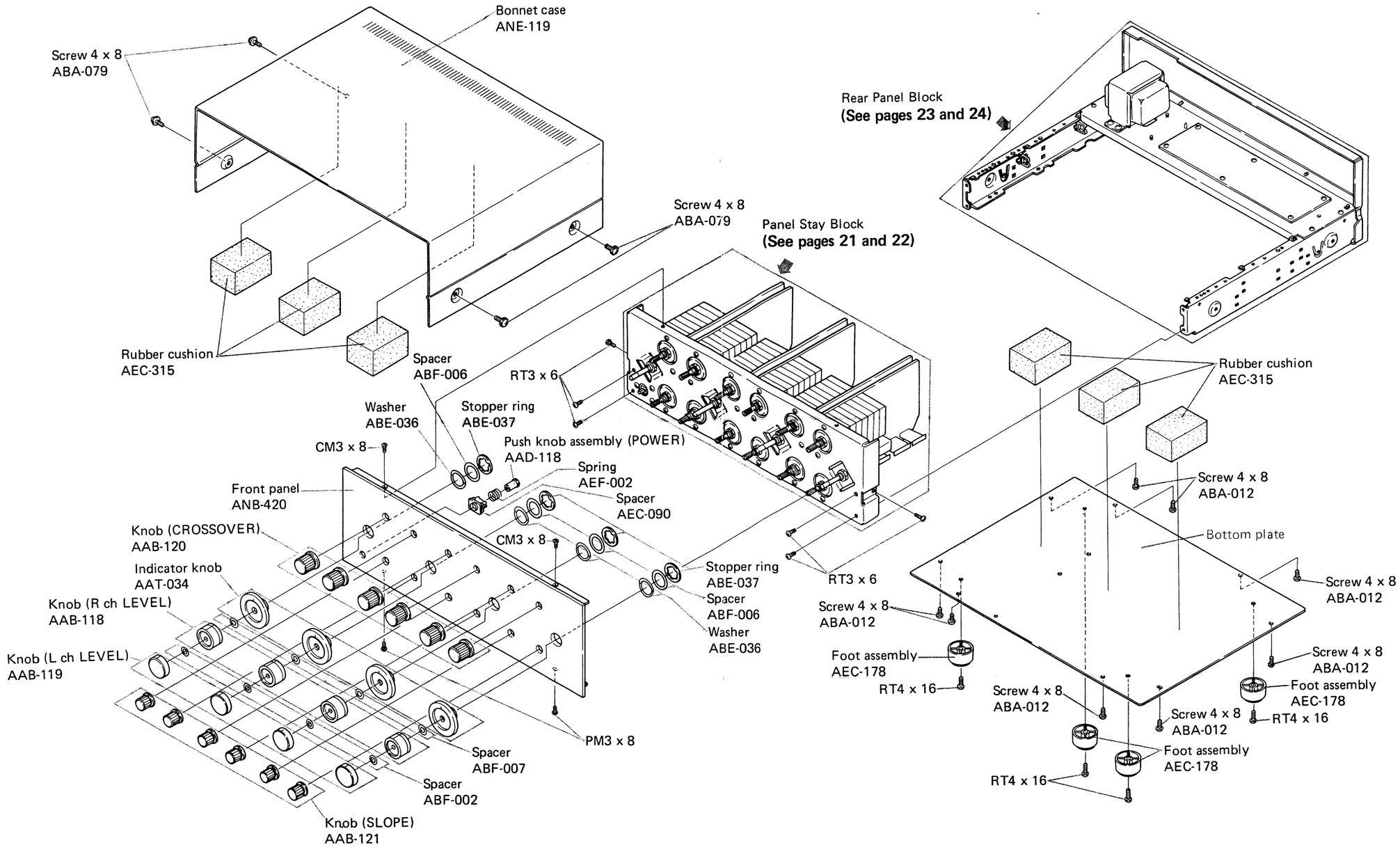
7.5 REAR PANEL VIEW



8. EXPLOOED VIEWS

NOTE:
Parts indicated in green type cannot be supplied.

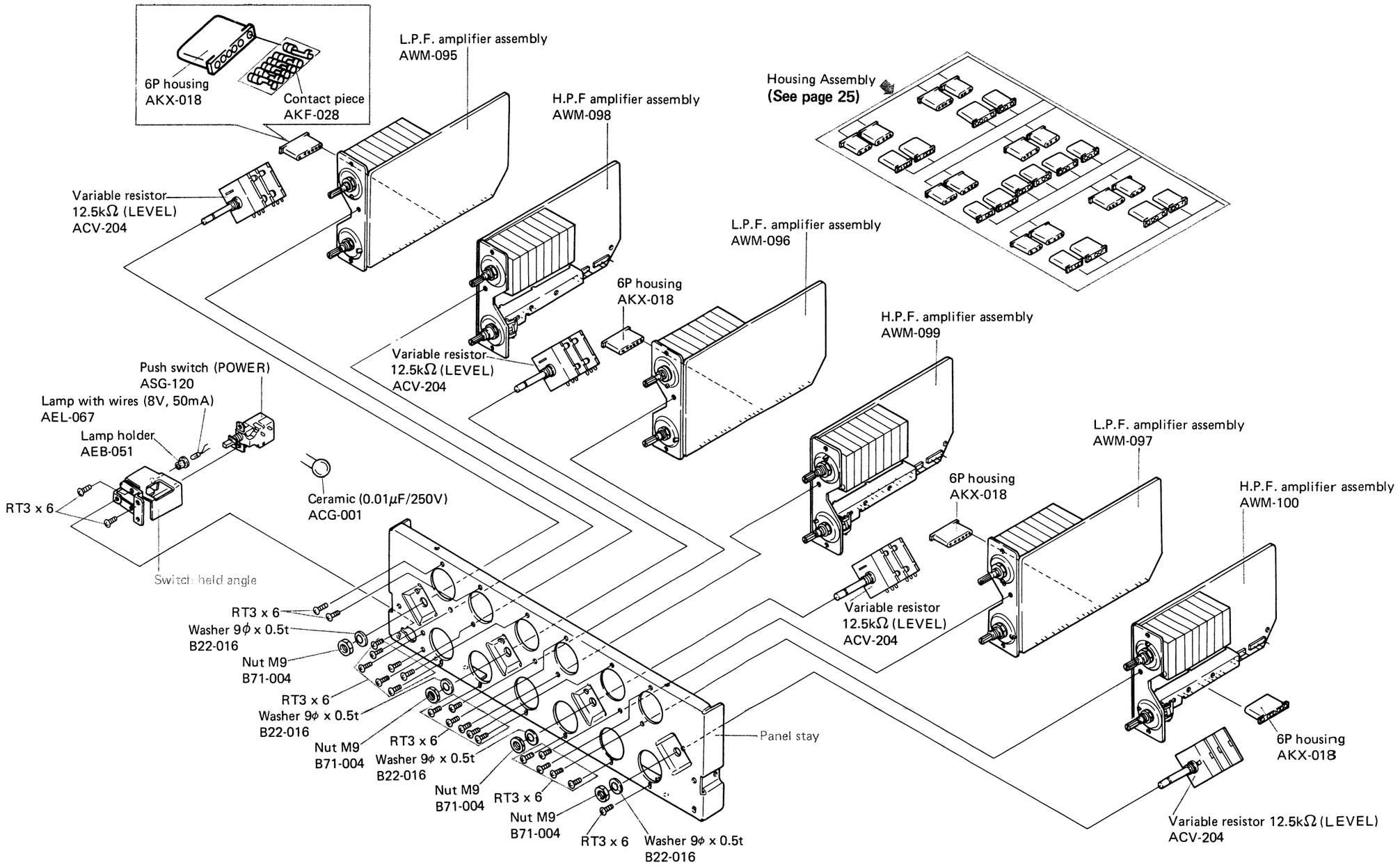
8.1 EXTERNAL PARTS



8.2 INTERNAL PARTS

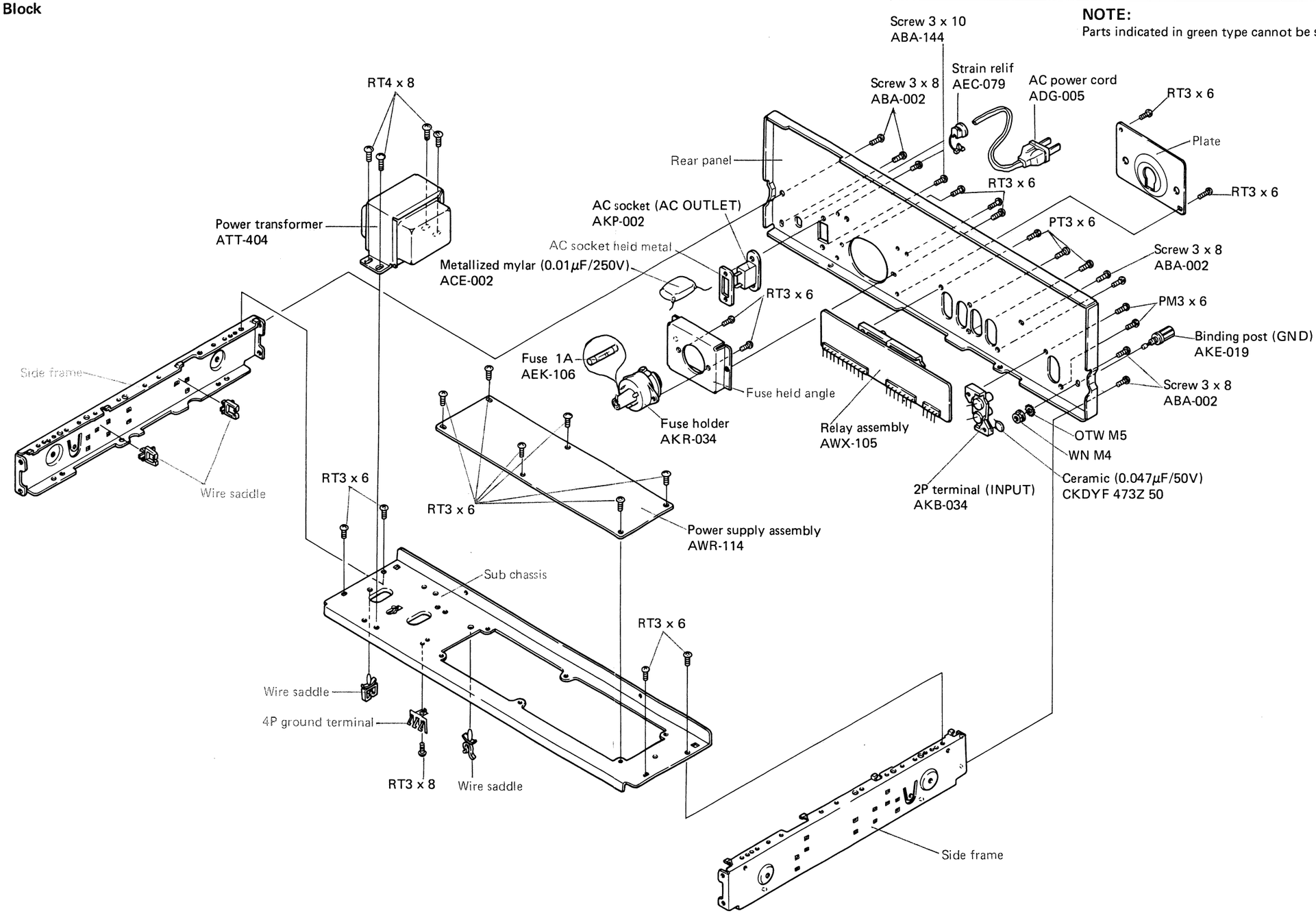
1. Panel Stay Block

NOTE:
Parts indicated in green type cannot be supplied.



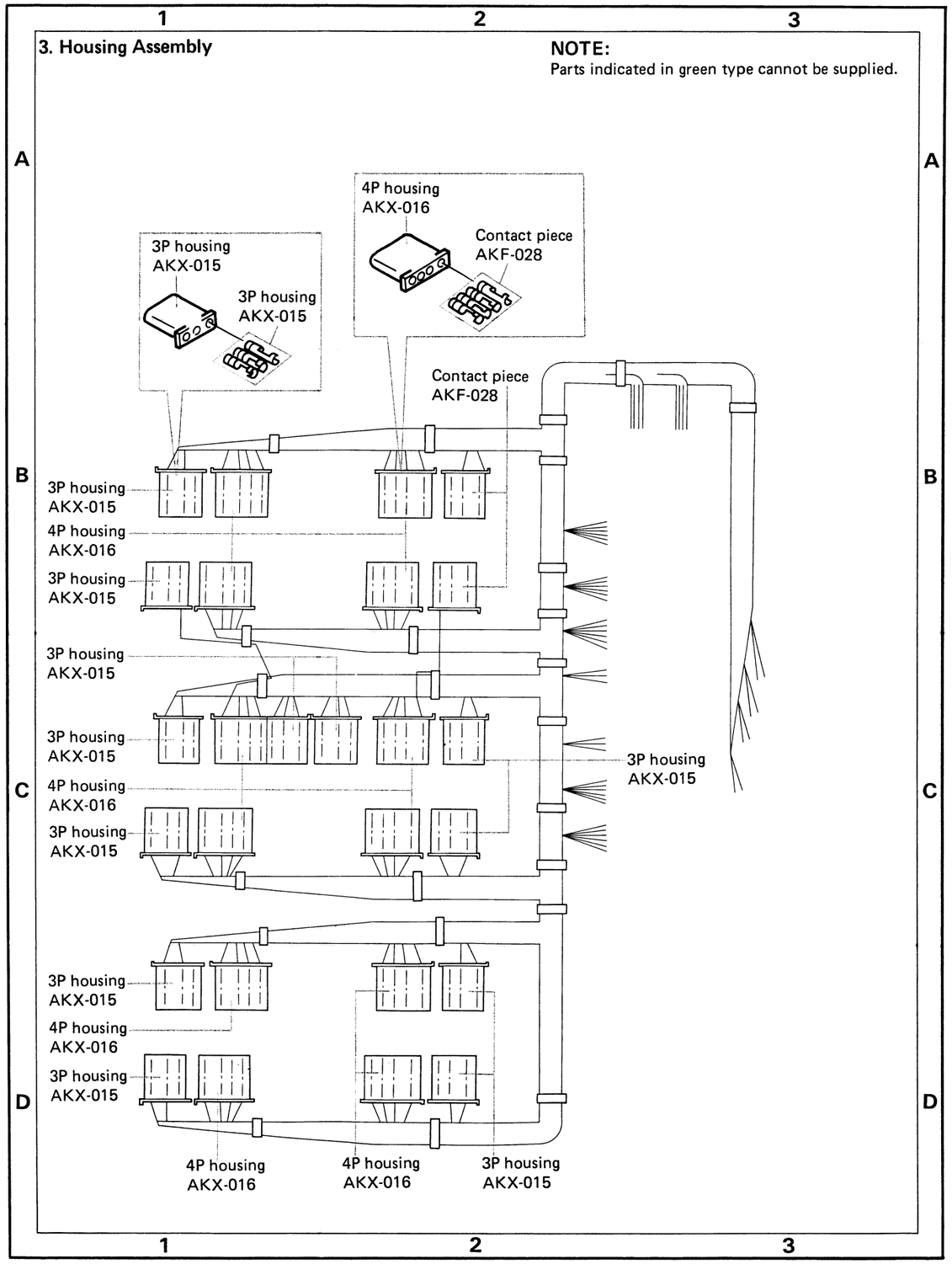
2. Rear Panel Block

NOTE:
Parts indicated in green type cannot be supplied.



3. Housing Assembly

NOTE:
Parts indicated in green type cannot be supplied.



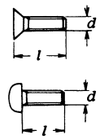
The following symbols stand for screws, washers and nuts as shown in exploded view.

Symbol	Description	Shape
RT	Brazier head tapping screw	
PT	Pan head tapping screw	
BT	Binding head tapping screw	
CT	Countersunk head tapping screw	
TT	Truss head tapping screw	
OCT	Oval countersunk head tapping screw	
PM	Pan head machine screw	
CM	Countersunk head machine screw	
OCM	Oval countersunk head machine screw	
TM	Truss head machine screw	
BM	Binding head machine screw	
PSA	Pan head screw with spring lock washer	
PSB	Pan head screw with spring lock washer and flat washer	
PSF	Pan head screw with flat washer	

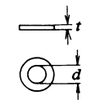
Symbol	Description	Shape
EW	E type washer	
FW	Flat washer	
SW	Spring lock washer	
N	Nut	
WN	Washer faced nut	
ITW	Internal toothed lock washer	
OTW	Outernal toothed lock washer	
SC	Slotted set screw (Cone point)	
SF	Slotted set screw (Flat point)	
HS	Hexagon socket headless set screw	
OCW	Oval countersunk head wood screw	
CW	Countersunk head wood screw	
RW	Round head wood screw	

EXAMPLE

PM・3×8
- 3 — length in mm (*l*)
- 8 — diameter in mm (*d*)
- PM — Symbol

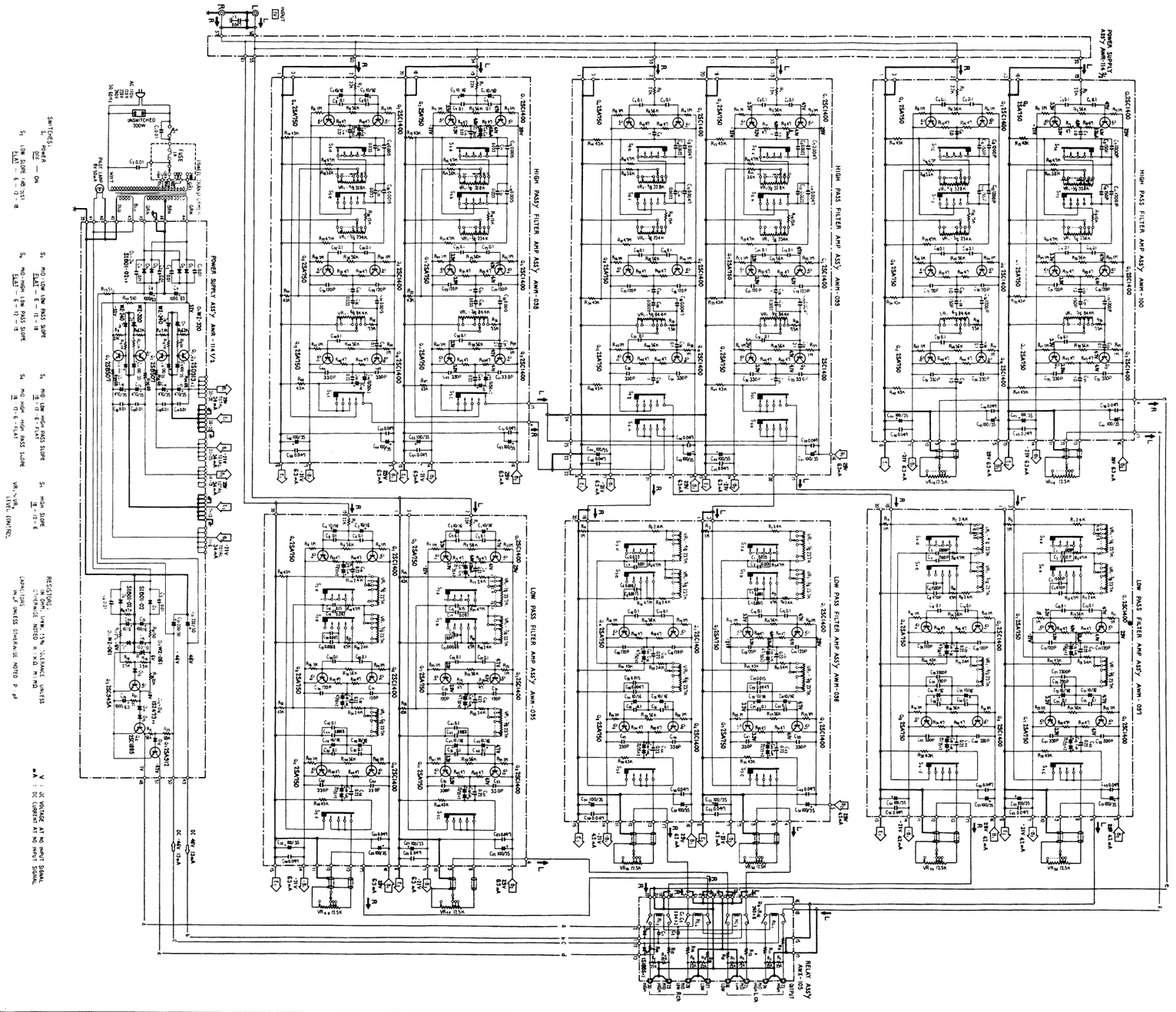


FW・9φ×1^{t}
- 1 — thickness in mm (*t*)
- 9φ — diameter in mm (*d*)
- FW — Symbol



9. SCHEMATIC DIAGRAMS, P.C. BOARD PATTERNS AND PARTS LIST

9.1 SCHEMATIC DIAGRAM AND MISCELLANOUS PARTS LIST

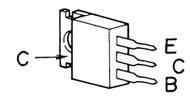


NOTE:
The indicated semiconductors are representative ones only. Other alternative semiconductors may be used and are listed in the parts list.

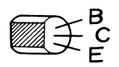
External Appearances of Transistors

2SC1400
2SA750
2SC945A

2SD313
2SD526
2SB507
2SB596



2SC1885
2SA912



NOTE:
- *Capacitors: in μF unless otherwise noted p:pF*
- *Resistors: in Ω, ¼W unless otherwise noted k:kΩ, M:MΩ*

Miscellaneous Parts List

SWITCH

Symbol	Description	Part No.
S1	Push switch (POWER)	ASG-120

LAMP AND FUSE

Symbol	Description	Part No.
PL1	Lamp with wires 8V 50mA	AEL-067
FU1	Fuse 1A	AEK-106

TRANSFORMER

Symbol	Description	Part No.
T1	Power transformer	ATT-404

CAPACITORS

Symbol	Description			Part No.
C1	Ceramic	0.01	250V	ACG-001
C2	Metallized mylar	0.01	250V	ACE-002
C3	Ceramic	0.047	50V	CKDYF 473Z 50

RESISTORS

Symbol	Description	Part No.
VR1	Variable resistor 12.5k (LEVEL)	ACV-204
VR2	Variable resistor 12.5k (LEVEL)	ACV-204
VR3	Variable resistor 12.5k (LEVEL)	ACV-204
VR4	Variable resistor 12.5k (LEVEL)	ACV-204

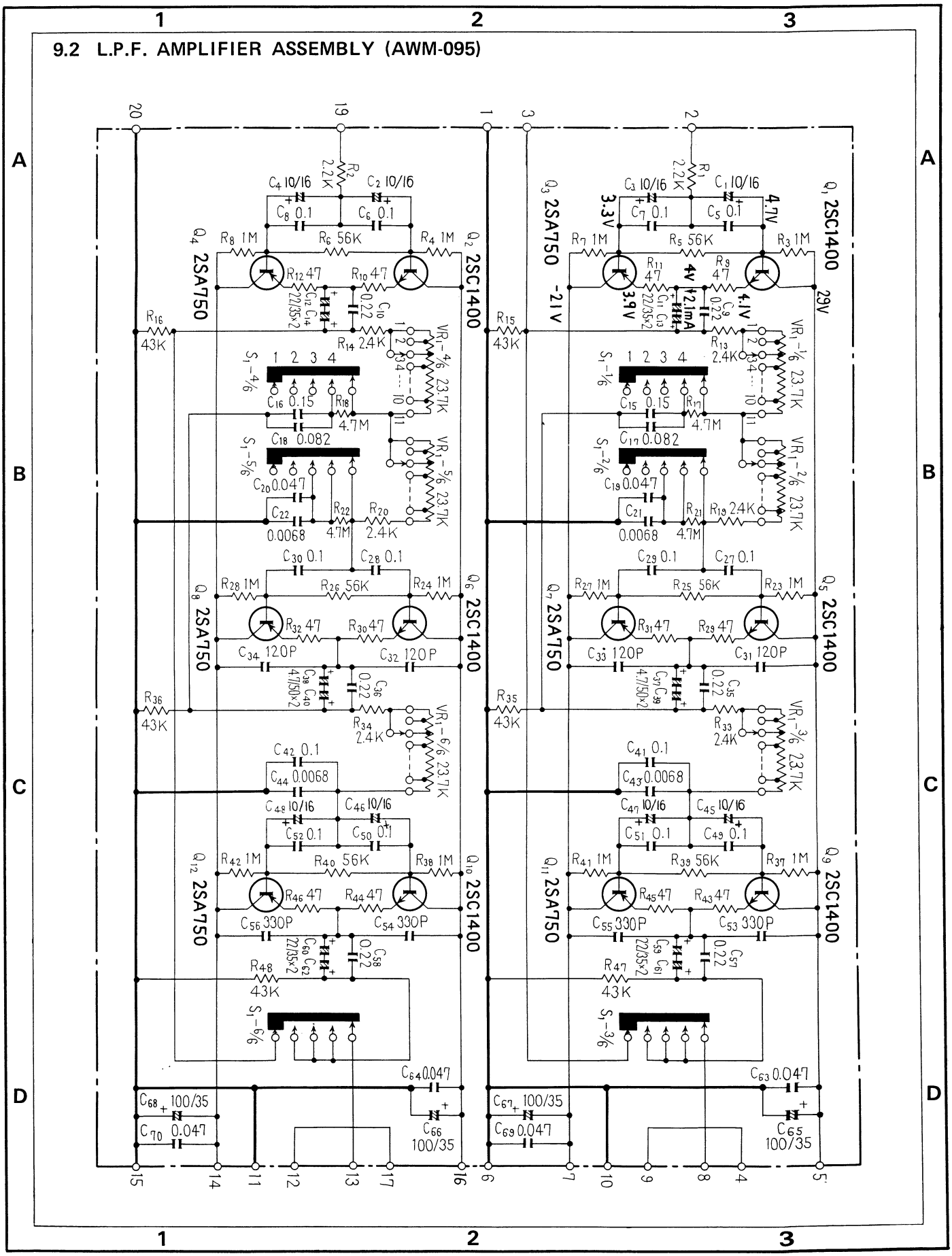
OTHERS

Symbol	Description	Part No.
	L.P.F. amplifier assembly	AWM-095
	L.P.F. amplifier assembly	AWM-096
	L.P.F. amplifier assembly	AWM-097
	H.P.F. amplifier assembly	AWM-098
	H.P.F. amplifier assembly	AWM-099
	H.P.F. amplifier assembly	AWM-100
	Power supply assembly	AWR-114
	Relay assembly	AWX-105
	AC socket (AC OUTLET)	AKP-002
	AC power cord	ADG-005
	Contact piece	AKF-028
	3P housing	AKX-015
	4P housing	AKX-016
	6P housing	AKX-018

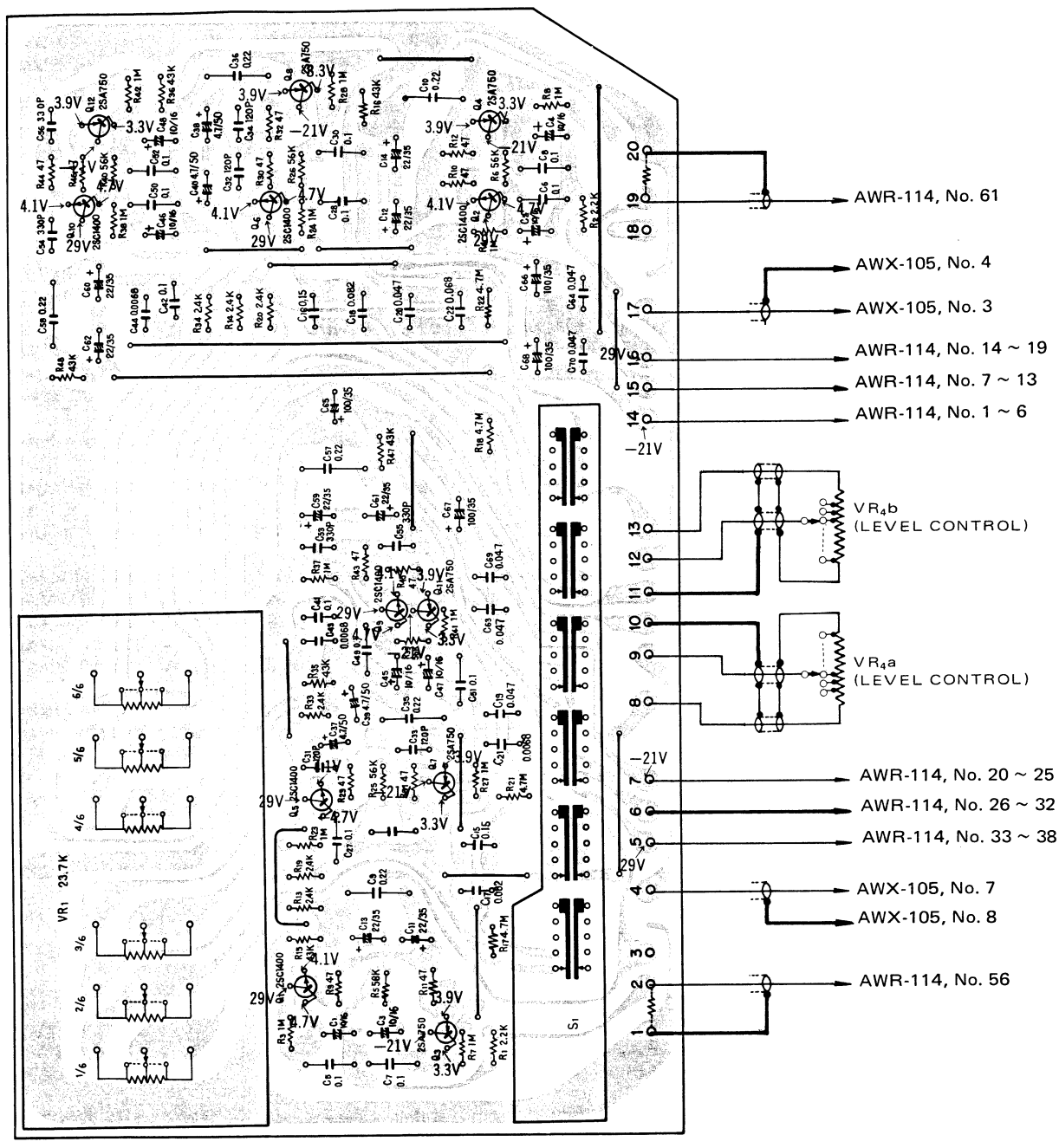
List of Changed Parts for Factory Modification

Symbol	Description	Part No.

9.2 L.P.F. AMPLIFIER ASSEMBLY (AWM-095)



Foil side


AWR-114, No. 61
AWX-105, No. 4
AWX-105, No. 3
AWR-114, No. 14 ~ 19
AWR-114, No. 7 ~ 13
AWR-114, No. 1 ~ 6
VR4b (LEVEL CONTROL)
VR4a (LEVEL CONTROL)
AWR-114, No. 20 ~ 25
AWR-114, No. 26 ~ 32
AWR-114, No. 33 ~ 38
AWX-105, No. 7
AWX-105, No. 8
AWR-114, No. 56
VR1 23.7K
S1

Parts List of L.P.F. Amplifier Assembly (AWM-095)

SWITCH

Symbol	Description	Part No.
S1	Rotary switch (SLOPE)	ASD-059

RESISTORS

Symbol	Description		Part No.
VR1	Variable resistor (CROSSOVER)		ACV-601
R1	Carbon film	2.2k	RD¼VS 222J
R2	Carbon film	2.2k	RD¼VS 222J
R3	Carbon film	1M	RD¼VS 105J NL
R4	Carbon film	1M	RD¼VS 105J NL
R5	Carbon film	56k	RD¼VS 563J
R6	Carbon film	56k	RD¼VS 563J
R7	Carbon film	1M	RD¼VS 105J NL
R8	Carbon film	1M	RD¼VS 105J NL
R9	Carbon film	47	RD¼VS 470J
R10	Carbon film	47	RD¼VS 470J
R11	Carbon film	47	RD¼VS 470J
R12	Carbon film	47	RD¼VS 470J
R13	Carbon film	2.4k	RD¼VS 242J
R14	Carbon film	2.4k	RD¼VS 242J
R15	Carbon film	43k	RD¼VS 433J
R16	Carbon film	43k	RD¼VS 433J
R17	Carbon film	4.7M	RD¼VS 475J
R18	Carbon film	4.7M	RD¼VS 475J
R19	Carbon film	2.4k	RD¼VS 242J
R20	Carbon film	2.4k	RD¼VS 242J
R21	Carbon film	4.7M	RD¼VS 475J
R22	Carbon film	4.7M	RD¼VS 475J
R23	Carbon film	1M	RD¼VS 105J NL
R24	Carbon film	1M	RD¼VS 105J NL
R25	Carbon film	56k	RD¼VS 563J
R26	Carbon film	56k	RD¼VS 563J
R27	Carbon film	1M	RD¼VS 105J NL
R28	Carbon film	1M	RD¼VS 105J NL
R29	Carbon film	47	RD¼VS 470J
R30	Carbon film	47	RD¼VS 470J
R31	Carbon film	47	RD¼VS 470J
R32	Carbon film	47	RD¼VS 470J
R33	Carbon film	2.4k	RD¼VS 242J
R34	Carbon film	2.4k	RD¼VS 242J
R35	Carbon film	43k	RD¼VS 433J
R36	Carbon film	43k	RD¼VS 433J
R37	Carbon film	1M	RD¼VS 105J NL
R38	Carbon film	1M	RD¼VS 105J NL
R39	Carbon film	56k	RD¼VS 563J
R40	Carbon film	56k	RD¼VS 563J
R41	Carbon film	1M	RD¼VS 105J NL
R42	Carbon film	1M	RD¼VS 105J NL
R43	Carbon film	47	RD¼VS 470J
R44	Carbon film	47	RD¼VS 470J
R45	Carbon film	47	RD¼VS 470J
R46	Carbon film	47	RD¼VS 470J
R47	Carbon film	43k	RD¼VS 433J
R48	Carbon film	43k	RD¼VS 433J

CAPACITORS

Symbol	Description			Part No.
C1	Electrolytic	10	16V	CEANL 100P 16
C2	Electrolytic	10	16V	CEANL 100P 16
C3	Electrolytic	10	16V	CEANL 100P 16
C4	Electrolytic	10	16V	CEANL 100P 16
C5	Mylar	0.1	50V	CQMA 104J 50
C6	Mylar	0.1	50V	CQMA 104J 50
C7	Mylar	0.1	50V	CQMA 104J 50
C8	Mylar	0.1	50V	CQMA 104J 50
C9	Mylar	0.22	50V	CQMA 224J 50
C10	Mylar	0.22	50V	CQMA 224J 50
C11	Electrolytic	22	35V	CEANL 220P 35
C12	Electrolytic	22	35V	CEANL 220P 35
C13	Electrolytic	22	35V	CEANL 220P 35
C14	Electrolytic	22	35V	CEANL 220P 35
C15	Polypropylene	0.15	50V	CQPA 154G 50
C16	Polypropylene	0.15	50V	CQPA 154G 50
C17	Mylar	0.082	50V	CQMA 823J 50
C18	Mylar	0.082	50V	CQMA 823J 50
C19	Polypropylene	0.047	50V	CQPA 473G 50
C20	Polypropylene	0.047	50V	CQPA 473G 50
C21	Mylar	6800p	50V	CQMA 682J 50
C22	Mylar	6800p	50V	CQMA 682J 50
C23	.....	.....		.....
C24	.....	.....		.....
C25	.....	.....		.....
C26	.....	.....		.....
C27	Mylar	0.1	50V	CQMA 104J 50
C28	Mylar	0.1	50V	CQMA 104J 50
C29	Mylar	0.1	50V	CQMA 104J 50
C30	Mylar	0.1	50V	CQMA 104J 50
C31	Polystyrene	120p	50V	CQSA 121J 50
C32	Polystyrene	120p	50V	CQSA 121J 50
C33	Polystyrene	120p	50V	CQSA 121J 50
C34	Polystyrene	120p	50V	CQSA 121J 50
C35	Mylar	0.22	50V	CQMA 224J 50

Symbol	Description			Part No.
C36	Mylar	0.22	50V	CQMA 224J 50
C37	Electrolytic	4.7	50V	CEANL 4R7P 50
C38	Electrolytic	4.7	50V	CEANL 4R7P 50
C39	Electrolytic	4.7	50V	CEANL 4R7P 50
C40	Electrolytic	4.7	50V	CEANL 4R7P 50
C41	Polypropylene	0.1	50V	CQPA 104G 50
C42	Polypropylene	0.1	50V	CQPA 104G 50
C43	Mylar	6800p	50V	CQMA 682J 50
C44	Mylar	6800p	50V	CQMA 682J 50
C45	Electrolytic	10	16V	CEANL 100P 16
C46	Electrolytic	10	16V	CEANL 100P 16
C47	Electrolytic	10	16V	CEANL 100P 16
C48	Electrolytic	10	16V	CEANL 100P 16
C49	Mylar	0.1	50V	CQMA 104J 50
C50	Mylar	0.1	50V	CQMA 104J 50
C51	Mylar	0.1	50V	CQMA 104J 50
C52	Mylar	0.1	50V	CQMA 104J 50
C53	Ceramic	330p	50V	CKDYF 331Z 50
C54	Ceramic	330p	50V	CKDYF 331Z 50
C55	Ceramic	330p	50V	CKDYF 331Z 50
C56	Ceramic	330p	50V	CKDYF 331Z 50
C57	Mylar	0.22	50V	CQMA 224J 50
C58	Mylar	0.22	50V	CQMA 224J 50
C59	Electrolytic	22	35V	CEANL 220P 35
C60	Electrolytic	22	35V	CEANL 220P 35
C61	Electrolytic	22	35V	CEANL 220P 35
C62	Electrolytic	22	35V	CEANL 220P 35
C63	Mylar	0.047	50V	CQMA 473J 50
C64	Mylar	0.047	50V	CQMA 473J 50
C65	Electrolytic	100	35V	CEA 101P 35
C66	Electrolytic	100	35V	CEA 101P 35
C67	Electrolytic	100	35V	CEA 101P 35
C68	Electrolytic	100	35V	CEA 101P 35
C69	Mylar	0.047	50V	CQMA 473J 50
C70	Mylar	0.047	50V	CQMA 473J 50

SEMICONDUCTORS

Symbol	Description	Part No.
Q1	Transistor	2SC1400-E
Q2	Transistor	2SC1400-E
Q3	Transistor	2SA750-E
Q4	Transistor	2SA750-E
Q5	Transistor	2SC1400-E
Q6	Transistor	2SC1400-E
Q7	Transistor	2SA750-E
Q8	Transistor	2SA750-E
Q9	Transistor	2SC1400-E
Q10	Transistor	2SC1400-E
Q11	Transistor	2SA750-E
Q12	Transistor	2SA750-E

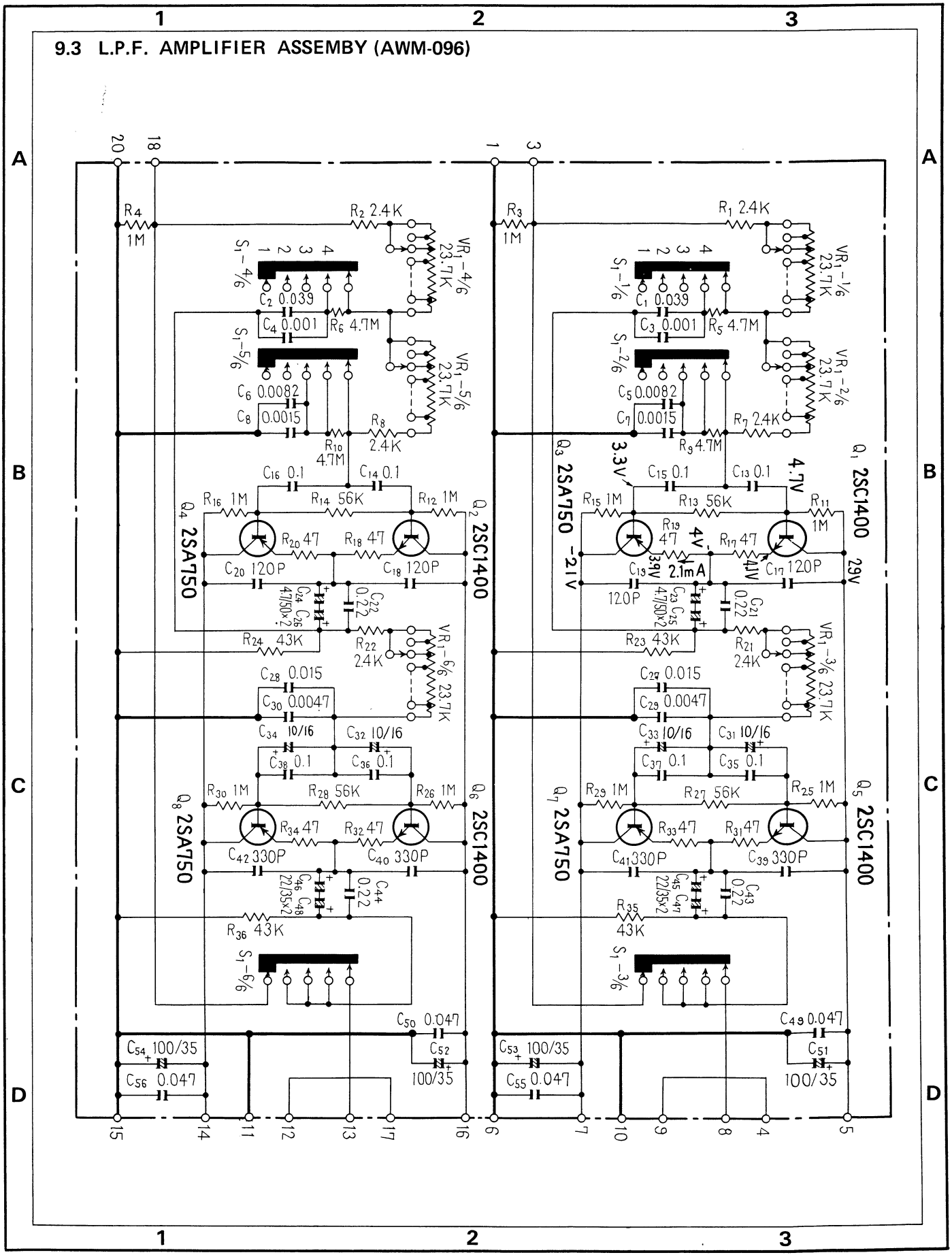
OTHERS

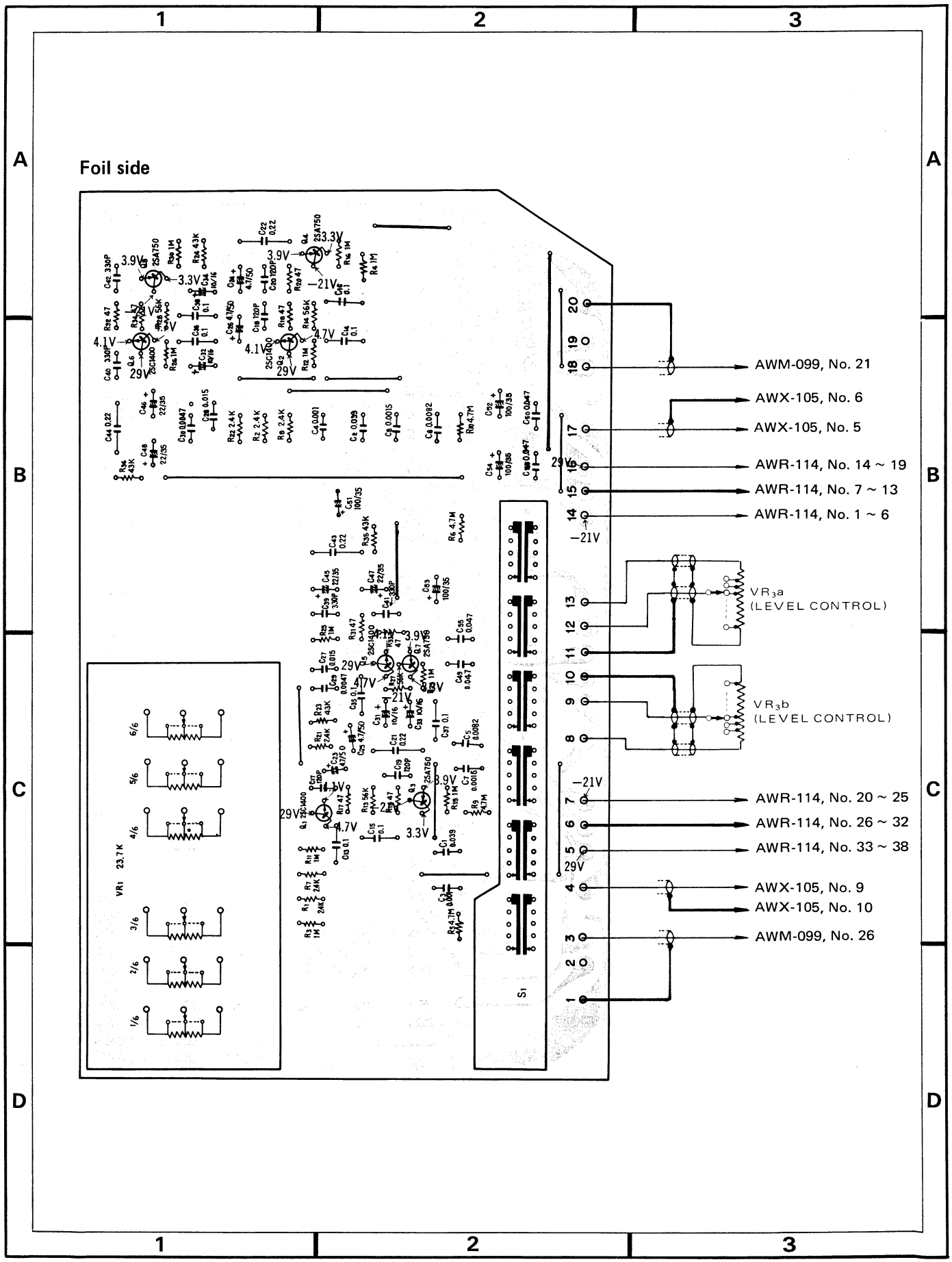
Symbol	Description	Part No.
	3P Plug	AKM-033
	4P Plug	AKM-034
	6P Plug	AKM-036
	Nut M9	ABN-024
	Nut M7	B71-010
	Washer M7	B22-018
	Clip	AEC-311

List of Changed Parts for Factory Modification

Symbol	Description	Part No.

9.3 L.P.F. AMPLIFIER ASSEMBY (AWM-096)




1
2
3
A
B
C
D
Foil side
AWM-099, No. 21
AWX-105, No. 6
AWX-105, No. 5
AWR-114, No. 14 ~ 19
AWR-114, No. 7 ~ 13
AWR-114, No. 1 ~ 6
VR3a
(LEVEL CONTROL)
VR3b
(LEVEL CONTROL)
AWR-114, No. 20 ~ 25
AWR-114, No. 26 ~ 32
AWR-114, No. 33 ~ 38
AWX-105, No. 9
AWX-105, No. 10
AWM-099, No. 26
−21V
29V
S1
VR1 23.7K

Parts List of L.P.F. Amplifier Assembly (AWM-096)

SWITCH

Symbol	Description	Part No.
S1	Rotary switch (SLOPE)	ASD-059

RESISTORS

Symbol	Description		Part No.
VR1	Variable resistor (CROSSOVER)		ACV-601
R1	Carbon film	2.4k	RD¼VS 242J
R2	Carbon film	2.4k	RD¼VS 242J
R3	Carbon film	1M	RD¼VS 105J
R4	Carbon film	1M	RD¼VS 105J
R5	Carbon film	4.7M	RD¼VS 475J
R6	Carbon film	4.7M	RD¼VS 475J
R7	Carbon film	2.4k	RD¼VS 242J
R8	Carbon film	2.4k	RD¼VS 242J
R9	Carbon film	4.7M	RD¼VS 475J
R10	Carbon film	4.7M	RD¼VS 475J
R11	Carbon film	1M	RD¼VS 105J NL
R12	Carbon film	1M	RD¼VS 105J NL
R13	Carbon film	56k	RD¼VS 563J
R14	Carbon film	56k	RD¼VS 563J
R15	Carbon film	1M	RD¼VS 105J NL
R16	Carbon film	1M	RD¼VS 105J NL
R17	Carbon film	47	RD¼VS 470J
R18	Carbon film	47	RD¼VS 470J
R19	Carbon film	47	RD¼VS 470J
R20	Carbon film	47	RD¼VS 470J
R21	Carbon film	2.4k	RD¼VS 242J
R22	Carbon film	2.4k	RD¼VS 242J
R23	Carbon film	43k	RD¼VS 433J
R24	Carbon iflm	43k	RD¼VS 433J
R25	Carbon film	1M	RD¼VS 105J NL
R26	Carbon film	1M	RD¼VS 105J NL
R27	Carbon film	56k	RD¼VS 563J
R28	Carbon film	56k	RD¼VS 563J
R29	Carbon film	1M	RD¼VS 105J NL
R30	Carbon film	1M	RD¼VS 105J NL
R31	Carbon film	47	RD¼VS 470J
R32	Carbon film	47	RD¼VS 470J
R33	Carbon film	47	RD¼VS 470J
R34	Carbon film	47	RD¼VS 470J
R35	Carbon film	43k	RD¼VS 433J
R36	Carbon film	43k	RD¼VS 433J

CAPACITORS

Symbol	Description			Part No.
C1	Polypropylene	0.039	50V	CQPA 393G 50
C2	Polypropylene	0.039	50V	CQPA 393G 50
C3	Mylar	1000p	50V	CQMA 102J 50
C4	Mylar	1000p	50V	CQMA 102J 50
C5	Polypropylene	8200p	50V	CQPA 822G 50
C6	Polypropylene	8200p	50V	CQPA 822G 50
C7	Mylar	1500p	50V	CQMA 152J 50
C8	Mylar	1500p	50V	CQMA 152J 50
C9	.....	.....		.....
C10	.....	.....		.....
C11	.....	.....		.....
C12	.....	.....		.....
C13	Mylar	0.1	50V	CQMA 104J 50
C14	Mylar	0.1	50V	CQMA 104J 50
C15	Mylar	0.1	50V	CQMA 104J 50
C16	Mylar	0.1	50V	CQMA 104J 50
C17	Polystyrene	120p	50V	CQSA 121J 50
C18	Polystyrene	120p	50V	CQSA 121J 50
C19	Polystyrene	120p	50V	CQSA 121J 50
C20	Polystyrene	120p	50V	CQSA 121J 50
C21	Mylar	0.22	50V	CQMA 224J 50
C22	Mylar	0.22	50V	CQMA 224J 50
C23	Electrolytic	4.7	50V	CEANL 4R7P 50
C24	Electrolytic	4.7	50V	CEANL 4R7P 50
C25	Electrolytic	4.7	50V	CEANL 4R7P 50
C26	Electrolytic	4.7	50V	CEANL 4R7P 50
C27	Polypropylene	0.015	50V	CQPA 153G 50
C28	Polypropylene	0.015	50V	CQPA 153G 50
C29	Mylar	4700p	50V	CQMA 472J 50
C30	Mylar	4700p	50V	CQMA 472J 50
C31	Electrolytic	10	16V	CEANL 100P 16
C32	Electrolytic	10	16V	CEANL 100P 16
C33	Electrolytic	10	16V	CEANL 100P 16
C34	Electrolytic	10	16V	CEANL 100P 16
C35	Mylar	0.1	50V	CQMA 104J 16
C36	Mylar	0.1	50V	CQMA 104J 50
C37	Mylar	0.1	50V	CQMA 104J 50
C38	Mylar	0.1	50V	CQMA 104J 50
C39	Polystyrene	330p	50V	CQSA 331J 50
C40	Polystyrene	330p	50V	CQSA 331J 50
C41	Polystyrene	330p	50V	CQSA 331J 50
C42	Polystyrene	330p	50V	CQSA 331J 50
C43	Mylar	0.22	50V	CQMA 224J 50
C44	Mylar	0.22	50V	CQMA 224J 50
C45	Electrolytic	22	35V	CEANL 220P 35
C46	Electrolytic	22	35V	CEANL 220P 35
C47	Electrolytic	22	35V	CEANL 220P 35
C48	Electrolytic	22	35V	CEANL 220P 35
C49	Mylar	0.047	50V	CQMA 473J 50
C50	Mylar	0.047	50V	CQMA 473J 50

Symbol	Description			Part No.
C51	Electrolytic	100	35V	CEA 101P 35
C52	Electrolytic	100	35V	CEA 101P 35
C53	Electrolytic	100	35V	CEA 101P 35
C54	Electrolytic	100	35V	CEA 101P 35
C55	Mylar	0.047	50V	CQMA 473J 50
C56	Mylar	0.047	50V	CQMA 473J 50

SEMICONDUCTORS

Symbol	Description	Part No.
Q1	Transistor	2SC1400-E
Q2	Transistor	2SC1400-E
Q3	Transistor	2SA750-E
Q4	Transistor	2SA750-E
Q5	Transistor	2SC1400-E
Q6	Transistor	2SC1400-E
Q7	Transistor	2SA750-E
Q8	Transistor	2SA750-E

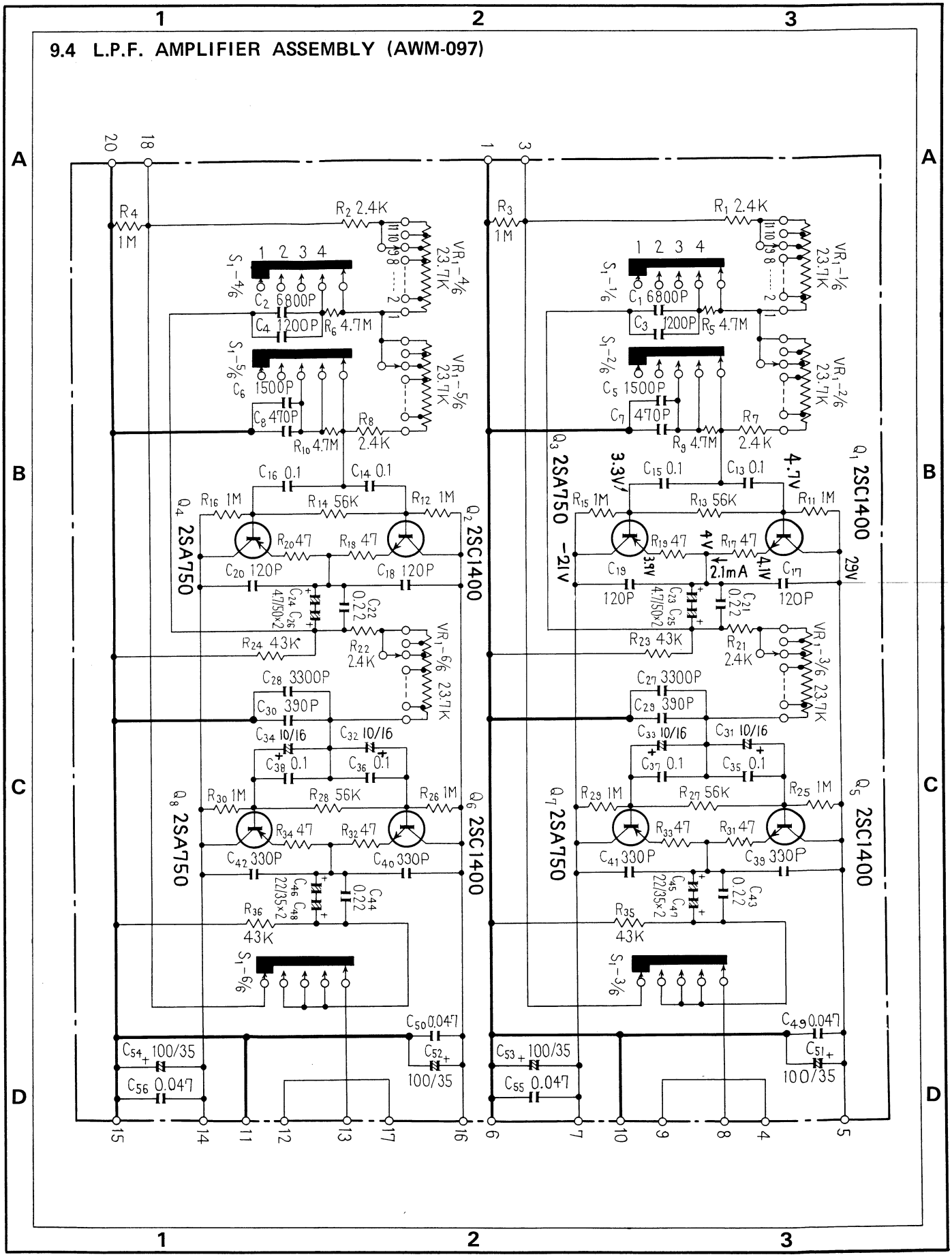
OTHERS

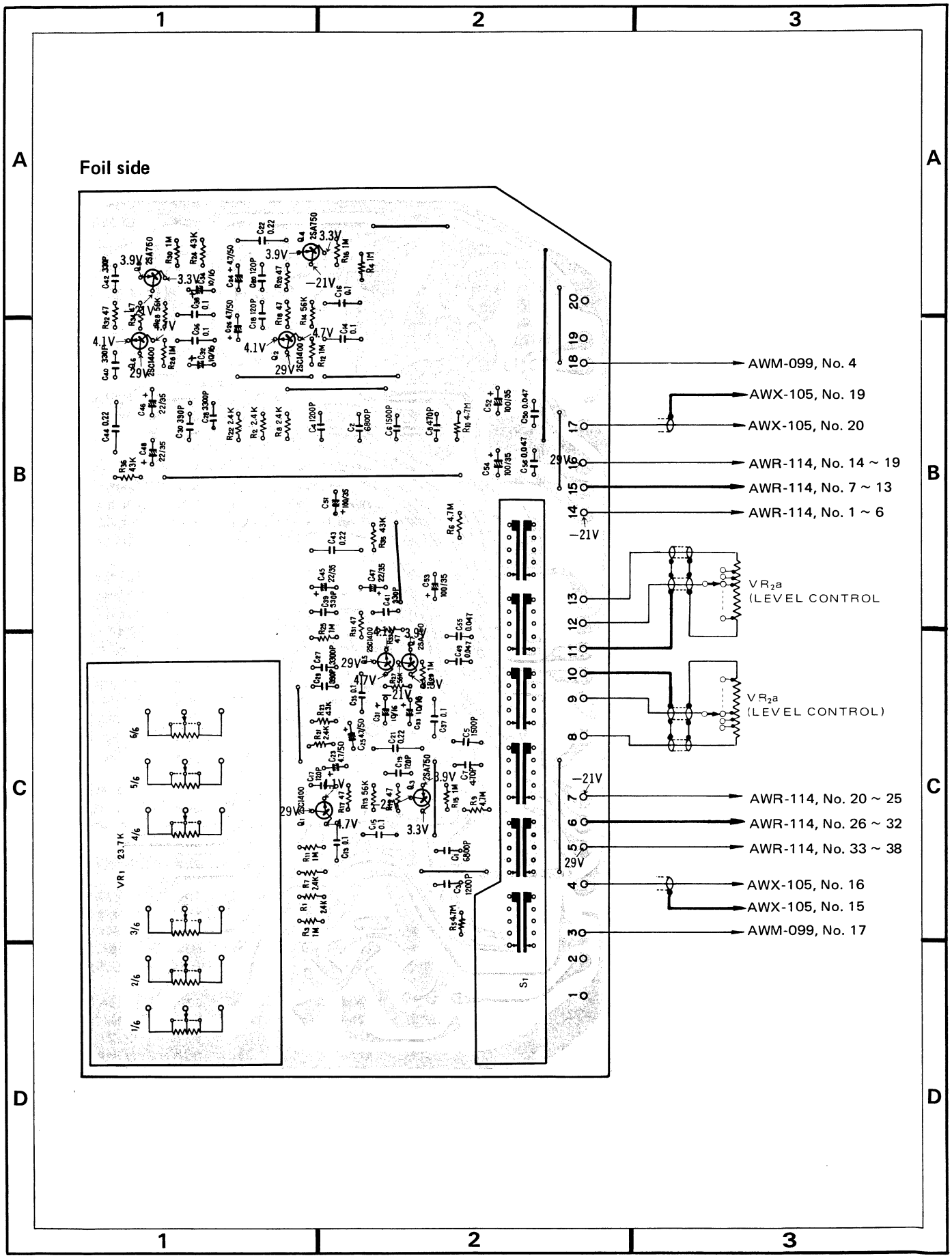
Symbol	Description	Part No.
	3P plug	AKM-033
	4P Plug	AKM-034
	6P Plug	AKM-036
	Nut M9	ABN-024
	Nut M7	B71-010
	Washer M7	B22-018
	Clip	AEC-311

List of Changed Parts for Factory Modification

Symbol	Description	Part No.

9.4 L.P.F. AMPLIFIER ASSEMBLY (AWM-097)




1
2
3
A
B
C
D
Foil side
AWM-099, No. 4
AWX-105, No. 19
AWX-105, No. 20
AWR-114, No. 14 ~ 19
AWR-114, No. 7 ~ 13
AWR-114, No. 1 ~ 6
VR2a (LEVEL CONTROL
VR2a (LEVEL CONTROL)
AWR-114, No. 20 ~ 25
AWR-114, No. 26 ~ 32
AWR-114, No. 33 ~ 38
AWX-105, No. 16
AWX-105, No. 15
AWM-099, No. 17
VR1 23.7K
6/6
5/6
4/6
3/6
2/6
1/6
S1
-21V
29V

Parts List of L.P.F. Amplifier Assembly (AWM-097)

SWITCH

Symbol	Description	Part No.
S1	Rotary switch (SLOPE)	ASD-059

RESISTORS

Symbol	Description		Part No.
VR1	Variable resistor (CROSSOVER)		ACV-601
R1	Carbon film	2.4k	RD¼VS 242J
R2	Carbon film	2.4k	RD¼VS 242J
R3	Carbon film	1M	RD¼VS 105J NL
R4	Carbon film	1M	RD¼VS 105J NL
R5	Carbon film	4.7M	RD¼VS 475J
R6	Carbon film	4.7M	RD¼VS 475J
R7	Carbon film	2.4k	RD¼VS 242J
R8	Carbon film	2.4k	RD¼VS 242J
R9	Carbon film	4.7M	RD¼VS 475J
R10	Carbon film	4.7M	RD¼VS 475J
R11	Carbon film	1M	RD¼VS 105J NL
R12	Carbon film	1M	RD¼VS 105J NL
R13	Carbon film	56k	RD¼VS 563J
R14	Carbon film	56k	RD¼VS 563J
R15	Carbon film	1M	RD¼VS 105J NL
R16	Carbon film	1M	RD¼VS 105J NL
R17	Carbon film	47	RD¼VS 470J
R18	Carbon film	47	RD¼VS 470J
R19	Carbon film	47	RD¼VS 470J
R20	Carbon film	47	RD¼VS 470J
R21	Carbon film	2.4k	RD¼VS 242J
R22	Carbon film	2.4k	RD¼VS 242J
R23	Carbon film	43k	RD¼VS 433J
R24	Carbon film	43k	RD¼VS 433J
R25	Carbon film	1M	RD¼VS 105J NL
R26	Carbon film	1M	RD¼VS 105J NL
R27	Carbon film	56k	RD¼VS 563J
R28	Carbon film	56k	RD¼VS 563J
R29	Carbon film	1M	RD¼VS 105J NL
R30	Carbon film	1M	RD¼VS 105J NL
R31	Carbon film	47	RD¼VS 470J
R32	Carbon film	47	RD¼VS 470J
R33	Carbon film	47	RD¼VS 470J
R34	Carbon film	47	RD¼VS 470J
R35	Carbon film	43k	RD¼VS 433J
R36	Carbon film	43k	RD¼VS 433J

CAPACITORS

Symbol	Description			Part No.
C1	Polypropylene	6800p	50V	CQPA 682G 50
C2	Polypropylene	6800p	50V	CQPA 682G 50
C3	Mylar	1200p	50V	CQMA 122J 50
C4	Mylar	1200p	50V	CQMA 122J 50
C5	Polypropylene	1500p	50V	CQPA 152G 50
C6	Polypropylene	1500p	50V	CQPA 152G 50
C7	Polystyrene	470p	50V	CQSA 471J 50
C8	Polystyrene	470p	50V	CQSA 471J 50
C9	.....	.....		.....
C10	.....	.....		.....
C11	.....	.....		.....
C12	.....	.....		.....
C13	Mylar	0.1	50V	CQMA 104J 50
C14	Mylar	0.1	50V	CQMA 104J 50
C15	Mylar	0.1	50V	CQMA 104J 50
C16	Mylar	0.1	50V	CQMA 104J 50
C17	Polystyrene	120p	50V	CQSA 121J 50
C18	Polystyrene	120p	50V	CQSA 121J 50
C19	Polystyrene	120p	50V	CQSA 121J 50
C20	Polystyrene	120p	50V	CQSA 121J 50
C21	Mylar	0.22	50V	CQMA 224J 50
C22	Mylar	0.22	50V	CQMA 224J 50
C23	Electrolytic	4.7	50V	CEANL 4R7P 50
C24	Electrolytic	4.7	50V	CEANL 4R7P 50
C25	Electrolytic	4.7	50V	CEANL 4R7P 50
C26	Electrolytic	4.7	50V	CEANL 4R7P 50
C27	Polypropylene	3300p	50V	CQPA 332G 50
C28	Polypropylene	3300p	50V	CQPA 332G 50
C29	Polystyrene	390p	50V	CQSA 391J 50
C30	Polystyrene	390p	50V	CQSA 391J 50
C31	Electrolytic	10	16V	CEANL 100P 16
C32	Electrolytic	10	16V	CEANL 100P 16
C33	Electrolytic	10	16V	CEANL 100P 16
C34	Electrolytic	10	16V	CEANL 100P 16
C35	Mylar	0.1	50V	CQMA 104J 50
C36	Mylar	0.1	50V	CQMA 104J 50
C37	Mylar	0.1	50V	CQMA 104J 50
C38	Mylar	0.1	50V	CQMA 104J 50
C39	Polystyrene	330p	50V	CQSA 331J 50
C40	Polystyrene	330p	50V	CQSA 331J 50
C41	Polystyrene	330p	50V	CQSA 331J 50
C42	Polystyrene	330p	50V	CQSA 331J 50
C43	Mylar	0.22	50V	CQMA 224J 50
C44	Mylar	0.22	50V	CQMA 224J 50
C45	Electrolytic	22	35V	CEANL 220P 35
C46	Electrolytic	22	35V	CEANL 220P 35
C47	Electrolytic	22	35V	CEANL 220P 35
C48	Electrolytic	22	35V	CEANL 220P 35
C49	Mylar	0.047	50V	CQMA 473J 50
C50	Mylar	0.047	50V	CQMA 473J 50

Symbol	Description			Part No.
C51	Electrolytic	100	35V	CEA 101P 35
C52	Electrolytic	100	35V	CEA 101P 35
C53	Electrolytic	100	35V	CEA 101P 35
C54	Electrolytic	100	35V	CEA 101P 35
C55	Mylar	0.047	50V	CQMA 473J 50
C56	Mylar	0.047	50V	CQMA 473J 50

SEMICONDUCTORS

Symbol	Description	Part No.
Q1	Transistor	2SC1400-E
Q2	Transistor	2SC1400-E
Q3	Transistor	2SA750-E
Q4	Transistor	2SA750-E
Q5	Transistor	2SC1400-E
Q6	Transistor	2SC1400-E
Q7	Transistor	2SA750-E
Q8	Transistor	2SA750-E

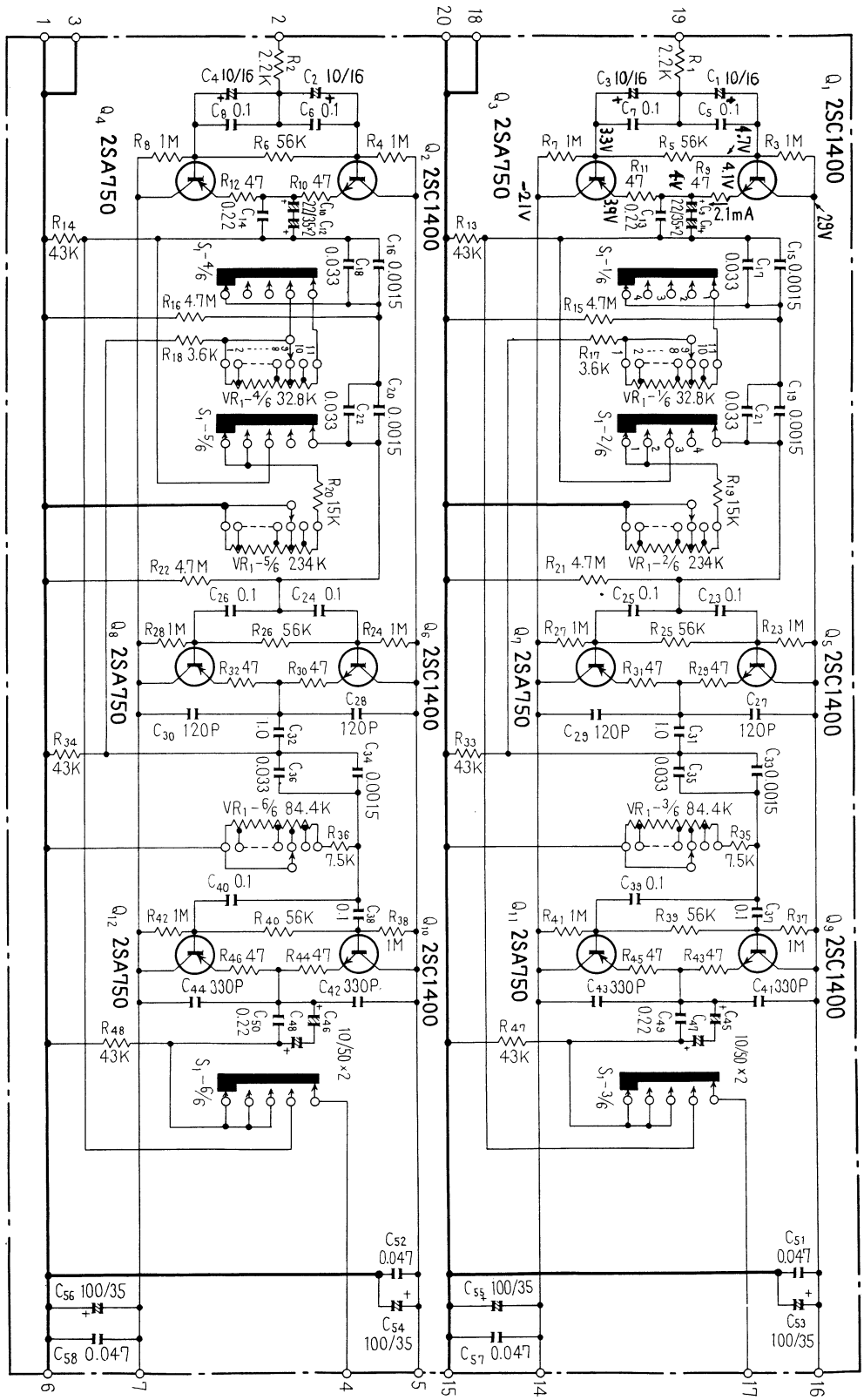
OTHERS

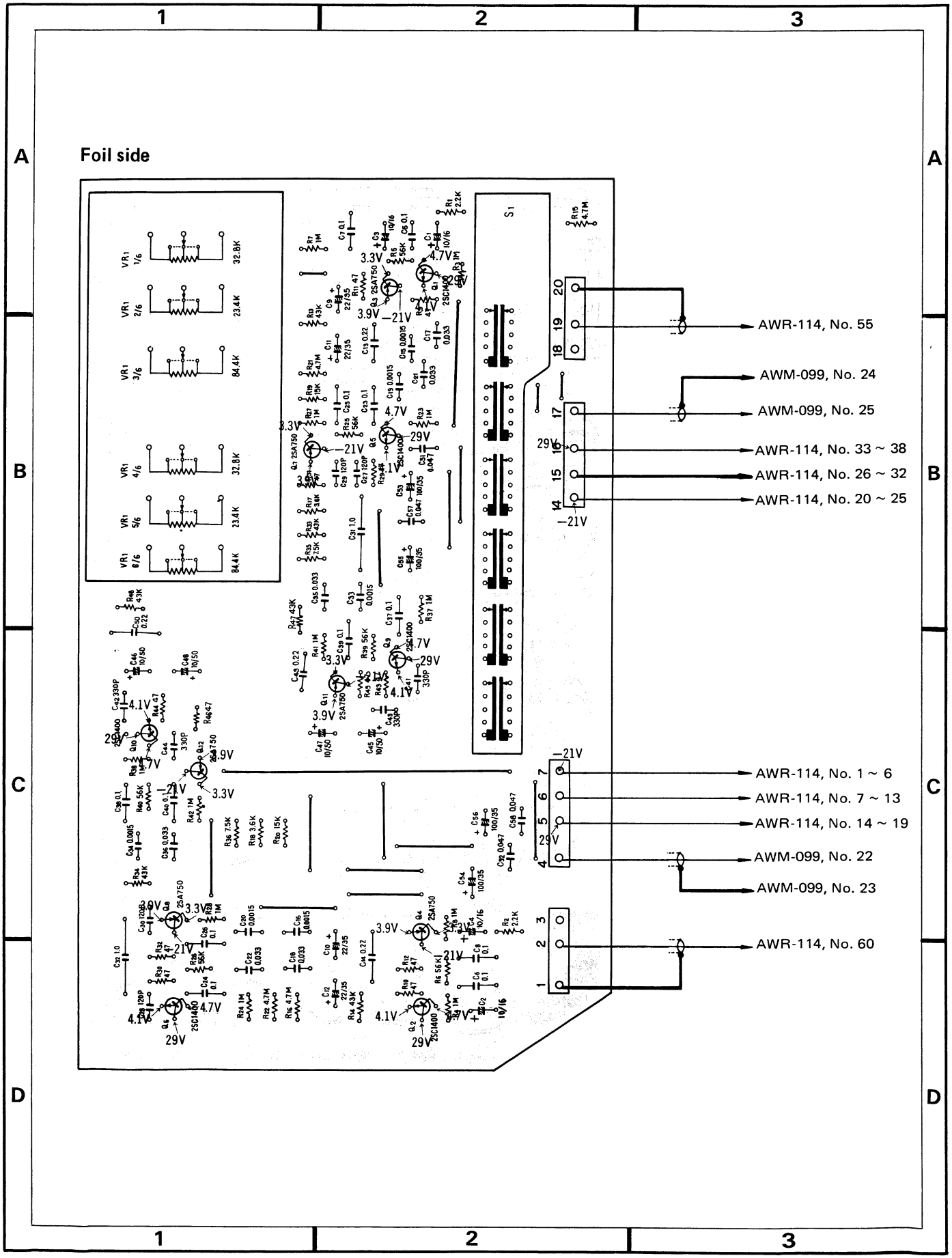
Symbol	Description	Part No.
	3P Plug	AKM-033
	4P Plug	AKM-034
	6P Plug	AKM-036
	Nut M9	ABN-024
	Nut M7	B71-010
	Washer M7	B22-018
	Clip M7	AEC-311

List of Changed Parts for Factory Modification

Symbol	Description	Part No.

9.5 H.P.F. AMPLIFIER ASSEMBLY (AWM-098)




1
2
3
A
B
C
D
Foil side
AWR-114, No. 55
AWM-099, No. 24
AWM-099, No. 25
AWR-114, No. 33 ~ 38
AWR-114, No. 26 ~ 32
AWR-114, No. 20 ~ 25
AWR-114, No. 1 ~ 6
AWR-114, No. 7 ~ 13
AWR-114, No. 14 ~ 19
AWM-099, No. 22
AWM-099, No. 23
AWR-114, No. 60

Parts List of H.P.F. Amplifier Assembly (AWM-098)

SWITCH

Symbol	Description	Part No.
S1	Rotary switch (SLOPE)	ASD-058

RESISTORS

Symbol	Description		Part No.
VR1	Variable resistor (CROSSOVER)		ACV-605
R1	Carbon film	2.2k	RD¼VS 222J
R2	Carbon film	2.2k	RD¼VS 222J
R3	Carbon film	1M	RD¼VS 105J NL
R4	Carbon film	1M	RD¼VS 105J NL
R5	Carbon film	56k	RD¼VS 563J
R6	Carbon film	56k	RD¼VS 563J
R7	Carbon film	1M	RD¼VS 105J NL
R8	Carbon film	1M	RD¼VS 105J NL
R9	Carbon film	47	RD¼VS 470J
R10	Carbon film	47	RD¼VS 470J
R11	Carbon film	47	RD¼VS 470J
R12	Carbon film	47	RD¼VS 470J
R13	Carbon film	43k	RD¼VS 433J
R14	Carbon film	43k	RD¼VS 433J
R15	Carbon film	4.7M	RD¼VS 475J
R16	Carbon film	4.7M	RD¼VS 475J
R17	Carbon film	3.6k	RD¼VS 362J
R18	Carbon film	3.6k	RD¼VS 362J
R19	Carbon film	15k	RD¼VS 153J
R20	Carbon film	15k	RD¼VS 153J
R21	Carbon film	4.7M	RD¼VS 475J
R22	Carbon film	4.7M	RD¼VS 475J
R23	Carbon film	1M	RD¼VS 105J NL
R24	Carbon film	1M	RD¼VS 105J NL
R25	Carbon film	56k	RD¼VS 563J
R26	Carbon film	56k	RD¼VS 563J
R27	Carbon film	1M	RD¼VS 105J NL
R28	Carbon film	1M	RD¼VS 105J NL
R29	Carbon film	47	RD¼VS 470J
R30	Carbon film	47	RD¼VS 470J
R31	Carbon film	47	RD¼VS 470J
R32	Carbon film	47	RD¼VS 470J
R33	Carbon film	43k	RD¼VS 433J
R34	Carbon film	43k	RD¼VS 433J
R35	Carbon film	7.5k	RD¼VS 752J
R36	Carbon film	7.5k	RD¼VS 752J
R37	Carbon film	1M	RD¼VS 105J NL
R38	Carbon film	1M	RD¼VS 105J NL
R39	Carbon film	56k	RD¼VS 563J
R40	Carbon film	56k	RD¼VS 563J
R41	Carbon film	1M	RD¼VS 105J NL
R42	Carbon film	1M	RD¼VS 105J NL
R43	Carbon film	47	RD¼VS 470J
R44	Carbon film	47	RD¼VS 470J
R45	Carbon film	47	RD¼VS 470J
R46	Carbon film	47	RD¼VS 470J
R47	Carbon film	43k	RD¼VS 433J
R48	Carbon film	43k	RD¼VS 433J

CAPACITORS

Symbol	Description			Part No.
C1	Electrolytic	10	16V	CEANL 100P 16
C2	Electrolytic	10	16V	CEANL 100P 16
C3	Electrolytic	10	16V	CEANL 100P 16
C4	Electrolytic	10	16V	CEANL 100P 16
C5	Mylar	0.1	50V	CQMA 104J 50
C6	Mylar	0.1	50V	CQMA 104J 50
C7	Mylar	0.1	50V	CQMA 104J 50
C8	Mylar	0.1	50V	CQMA 104J 50
C9	Electrolytic	22	35V	CEANL 220P 35
C10	Electrolytic	22	35V	CEANL 220P 35
C11	Electrolytic	22	35V	CEANL 220P 35
C12	Electrolytic	22	35V	CEANL 220P 35
C13	Mylar	0.22	50V	CQMA 224J 50
C14	Mylar	0.22	50V	CQMA 224J 50
C15	Mylar	1500p	50V	CQMA 152J 50
C16	Mylar	1500p	50V	CQMA 152J 50
C17	Polypropylene	0.033	50V	CQPA 333G 50
C18	Polypropylene	0.033	50V	CQPA 333G 50
C19	Mylar	1500p	50V	CQMA 152J 50
C20	Mylar	1500p	50V	CQMA 152J 50
C21	Polypropylene	0.033	50V	CQPA 333G 50
C22	Polypropylene	0.033	50V	CQPA 333G 50
C23	Mylar	0.1	50V	CQMA 104J 50
C24	Mylar	0.1	50V	CQMA 104J 50
C25	Mylar	0.1	50V	CQMA 104J 50
C26	Mylar	0.1	50V	CQMA 104J 50
C27	Polystyrene	120p	50V	CQSA 121J 50
C28	Polystyrene	120p	50V	CQSA 121J 50
C29	Polystyrene	120p	50V	CQSA 121J 50
C30	Polystyrene	120p	50V	CQSA 121J 50
C31	Metallized mylar	1	100V	ACE-008
C32	Metallized mylar	1	100V	ACE-008
C33	Mylar	1500p	50V	CQMA 152J 50
C34	Mylar	1500p	50V	CQMA 152J 50
C35	Polypropylene	0.033	50V	CQPA 333G 50

Symbol	Description			Part No.
C36	Polypropylene	0.033	50V	CQPA 333G 50
C37	Mylar	0.1	50V	CQMA 104J 50
C38	Mylar	0.1	50V	CQMA 104J 50
C39	Mylar	0.1	50V	CQMA 104J 50
C40	Mylar	0.1	50V	CQMA 104J 50
C41	Polystyrene	330p	50V	CQSA 331K 50
C42	Polystyrene	330p	50V	CQSA 331K 50
C43	Polystyrene	330p	50V	CQSA 331K 50
C44	Polystyrene	330p	50V	CQSA 331K 50
C45	Electrolytic	10	50V	CEANL 100P 50
C46	Electrolytic	10	50V	CEANL 100P 50
C47	Electrolytic	10	50V	CEANL 100P 50
C48	Electrolytic	10	50V	CEANL 100P 50
C49	Mylar	0.22	50V	CQMA 224J 50
C50	Mylar	0.22	50V	CQMA 224J 50
C51	Mylar	0.047	50V	CQMA 473J 50
C52	Mylar	0.047	50V	CQMA 473J 50
C53	Electrolytic	100	35V	CEA 101P 35
C54	Electrolytic	100	35V	CEA 101P 35
C55	Electrolytic	100	35V	CEA 101P 35
C56	Electrolytic	100	35V	CEA 101P 35
C57	Mylar	0.047	50V	CQMA 473J 50
C58	Mylar	0.047	50V	CQMA 473J 50

SEMICONDUCTORS

Symbol	Description	Part No.
Q1	Transistor	2SC1400-E
Q2	Transistor	2SC1400-E
Q3	Transistor	2SA750-E
Q4	Transistor	2SA750-E
Q5	Transistor	2SC1400-E
Q6	Transistor	2SC1400-E
Q7	Transistor	2SA750-E
Q8	Transistor	2SA750-E
Q9	Transistor	2SC1400-E
Q10	Transistor	2SC1400-E
Q11	Transistor	2SA750-E
Q12	Transistor	2SA750-E

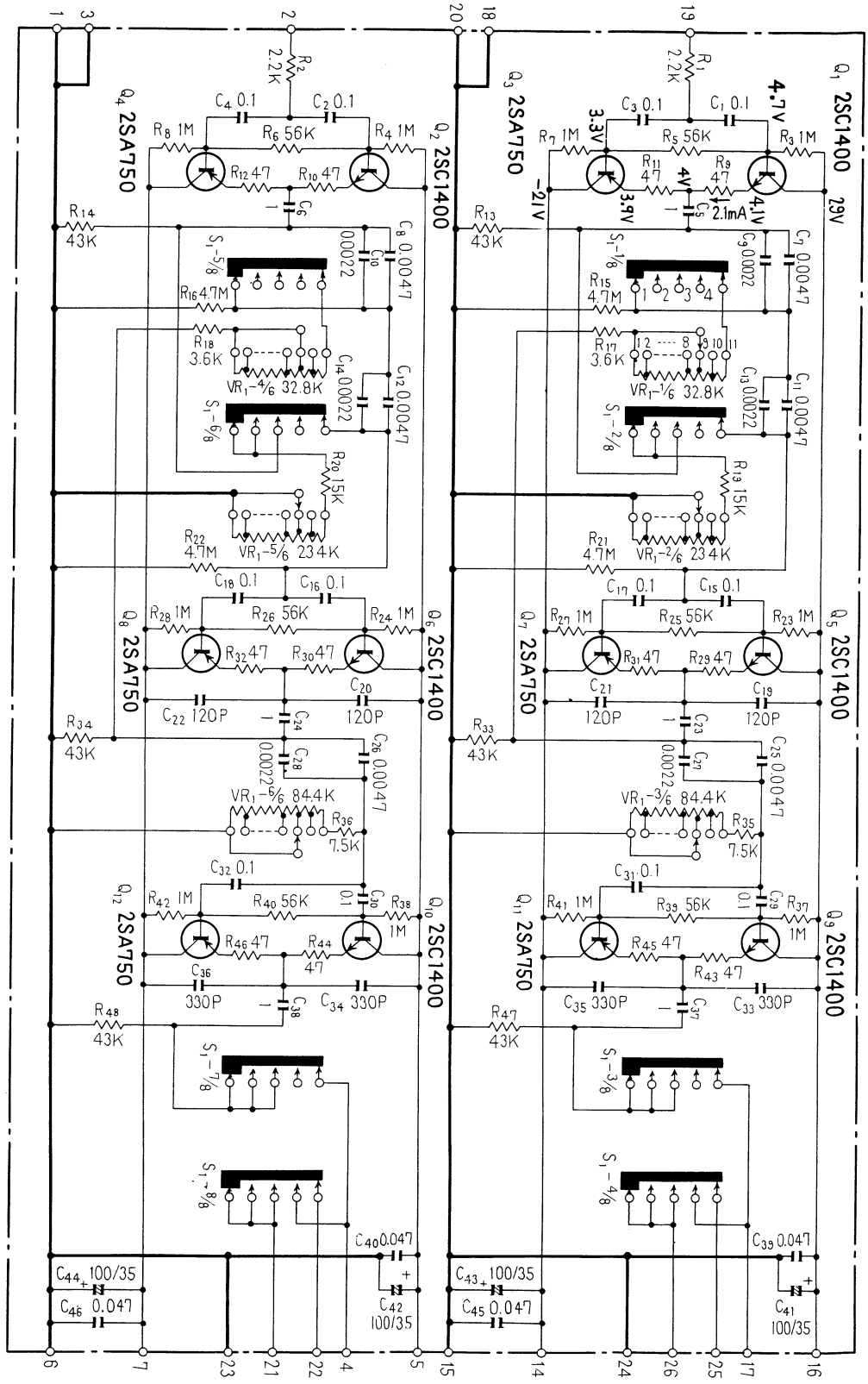
OTHERS

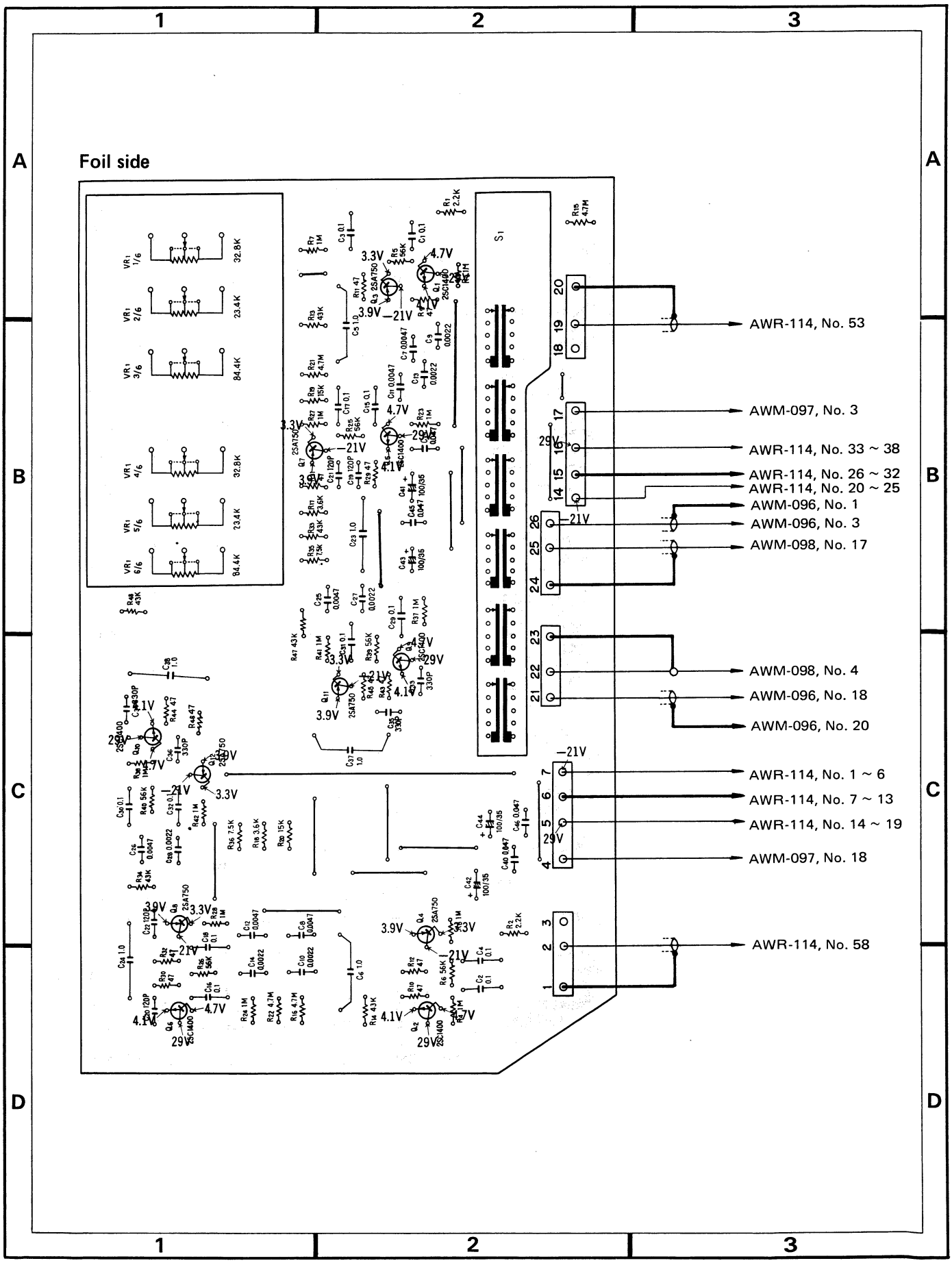
Symbol	Description	Part No.
	3P Plug	AKM-033
	4P Plug	AKM-034
	Nut M9	ABN-024
	Nut M7	B71-010
	Washer M7	B22-018
	Clip	AEC-311

List of Changed Parts for Factory Modification

Symbol	Description	Part No.

9.6 H.P.F. AMPLIFIER ASSEMBLY (AWM-099)




1
2
3
A
B
C
D
Foil side
AWR-114, No. 53
AWM-097, No. 3
AWR-114, No. 33 ~ 38
AWR-114, No. 26 ~ 32
AWR-114, No. 20 ~ 25
AWM-096, No. 1
AWM-096, No. 3
AWM-098, No. 17
AWM-098, No. 4
AWM-096, No. 18
AWM-096, No. 20
AWR-114, No. 1 ~ 6
AWR-114, No. 7 ~ 13
AWR-114, No. 14 ~ 19
AWM-097, No. 18
AWR-114, No. 58

Part List of H.P.F. Amplifier Assembly (AWM-099)

SWITCH

Symbol	Description	Part No.
S1	Rotary switch (SLOPE)	ASD-058

RESISTORS

Symbol	Description		Part No.
VR1	Variable resistor (CROSSOVER)		ACV-605
R1	Carbon film	2.2k	RD¼VS 222J
R2	Carbon film	2.2k	RD¼VS 222J
R3	Carbon film	1M	RD¼PS 105J NL
R4	Carbon film	1M	RD¼PS 105J NL
R5	Carbon film	56k	RD¼VS 563J
R6	Carbon film	56k	RD¼VS 563J
R7	Carbon film	1M	RD¼PS 105J NL
R8	Carbon film	1M	RD¼PS 105J NL
R9	Carbon film	47	RD¼VS 470J
R10	Carbon film	47	RD¼VS 470J
R11	Carbon film	47	RD¼VS 470J
R12	Carbon film	47	RD¼VS 470J
R13	Carbon film	43k	RD¼VS 433J
R14	Carbon film	43k	RD¼VS 433J
R15	Carbon film	4.7M	RD¼VS 475J
R16	Carbon film	4.7M	RD¼VS 475J
R17	Carbon film	3.6k	RD¼VS 362J
R18	Carbon film	3.6k	RD¼VS 362J
R19	Carbon film	15k	RD¼VS 153J
R20	Carbon film	15k	RD¼VS 153J
R21	Carbon film	4.7M	RD¼VS 475J
R22	Carbon film	4.7M	RD¼VS 475J
R23	Carbon film	1M	RD¼PS 105J NL
R24	Carbon film	1M	RD¼PS 105J NL
R25	Carbon film	56k	RD¼VS 563J
R26	Carbon film	56k	RD¼VS 563J
R27	Carbon film	1M	RD¼PS 105J NL
R28	Carbon film	1M	RD¼PS 105J NL
R29	Carbon film	47	RD¼VS 470J
R30	Carbon film	47	RD¼VS 470J
R31	Carbon film	47	RD¼VS 470J
R32	Carbon film	47	RD¼VS 470J
R33	Carbon film	43k	RD¼VS 433J
R34	Carbon film	43k	RD¼VS 433J
R35	Carbon film	7.5k	RD¼VS 752J
R36	Carbon film	7.5k	RD¼VS 752J
R37	Carbon film	1M	RD¼PS 105J NL
R38	Carbon film	1M	RD¼PS 105J NL
R39	Carbon film	56k	RD¼VS 563J
R40	Carbon film	56k	RD¼VS 563J
R41	Carbon film	1M	RD¼PS 105J NL
R42	Carbon film	1M	RD¼PS 105J NL
R43	Carbon film	47	RD¼VS 470J
R44	Carbon film	47	RD¼VS 470J
R45	Carbon film	47	RD¼VS 470J
R46	Carbon film	47	RD¼VS 470J
R47	Carbon film	43k	RD¼VS 433J
R48	Carbon film	43k	RD¼VS 433J

CAPACITORS

Symbol	Description			Part No.
C1	Mylar	0.1	50V	CQMA 104J 50
C2	Mylar	0.1	50V	CQMA 104J 50
C3	Mylar	0.1	50V	CQMA 104J 50
C4	Mylar	0.1	50V	CQMA 104J 50
C5	Metallized mylar	1	100V	AEC-008
C6	Metallized mylar	1	100V	AEC-008
C7	Polypropylene	4700p	50V	CQPA 472G 50
C8	Polypropylene	4700p	50V	CQPA 472G 50
C9	Mylar	2200p	50V	CQMA 222J 50
C10	Mylar	2200p	50V	CQMA 222J 50
C11	Polypropylene	4700p	50V	CQPA 472G 50
C12	Polypropylene	4700p	50V	CQPA 472G 50
C13	Mylar	2200p	50V	CQMA 222J 50
C14	Mylar	2200p	50V	CQMA 222J 50
C15	Mylar	0.1	50V	CQMA 104J 50
C16	Mylar	0.1	50V	CQMA 104J 50
C17	Mylar	0.1	50V	CQMA 104J 50
C18	Mylar	0.1	50V	CQMA 104J 50
C19	Polystyrene	120p	50V	CQSA 121J 50
C20	Polystyrene	120p	50V	CQSA 121J 50
C21	Polystyrene	120p	50V	CQSA 121J 50
C22	Polystyrene	120p	50V	CQSA 121J 50
C23	Metallized mylar	1	100V	AEC-008
C24	Metallized mylar	1	100V	AEC-008
C25	Polypropylene	4700p	50V	CQPA 472G 50
C26	Polypropylene	4700p	50V	CQPA 472G 50
C27	Mylar	2200p	50V	CQMA 222J 50
C28	Mylar	2200p	50V	CQMA 222J 50
C29	Mylar	0.1	50V	CQMA 104J 50
C30	Mylar	0.1	50V	CQMA 104J 50
C31	Mylar	0.1	50V	CQMA 104J 50
C32	Mylar	0.1	50V	CQMA 104J 50
C33	Polystyrene	330p	50V	CQSA 331J 50
C34	Polystyrene	330p	50V	CQSA 331J 50
C35	Polystyrene	330p	50V	CQSA 331J 50

Symbol	Description			Part No.
C36	Polystyrene	330p	50V	CQSA 331J 50
C37	Metallized mylar	1	100V	AEC-008
C38	Metallized mylar	1	100V	AEC-008
C39	Mylar	0.047	50V	CQMA 473J 50
C40	Mylar	0.047	50V	CQMA 473J 50
C41	Electrolytic	100	35V	CEA 101P 35
C42	Electrolytic	100	35V	CEA 101P 35
C43	Electrolytic	100	35V	CEA 101P 35
C44	Electrolytic	100	35V	CEA 101P 35
C45	Mylar	0.047	50V	CQMA 473J 50
C46	Mylar	0.047	50V	CQMA 473J 50

SEMICONDUCTORS

Symbol	Description	Part No.
Q1	Transistor	2SC1400-E
Q2	Transistor	2SC1400-E
Q3	Transistor	2SA750-E
Q4	Transistor	2SA750-E
Q5	Transistor	2SC1400-E
Q6	Transistor	2SC1400-E
Q7	Transistor	2SA750-E
Q8	Transistor	2SA750-E
Q9	Transistor	2SC1400-E
Q10	Transistor	2SC1400-E
Q11	Transistor	2SA750-E
Q12	Transistor	2SA750-E

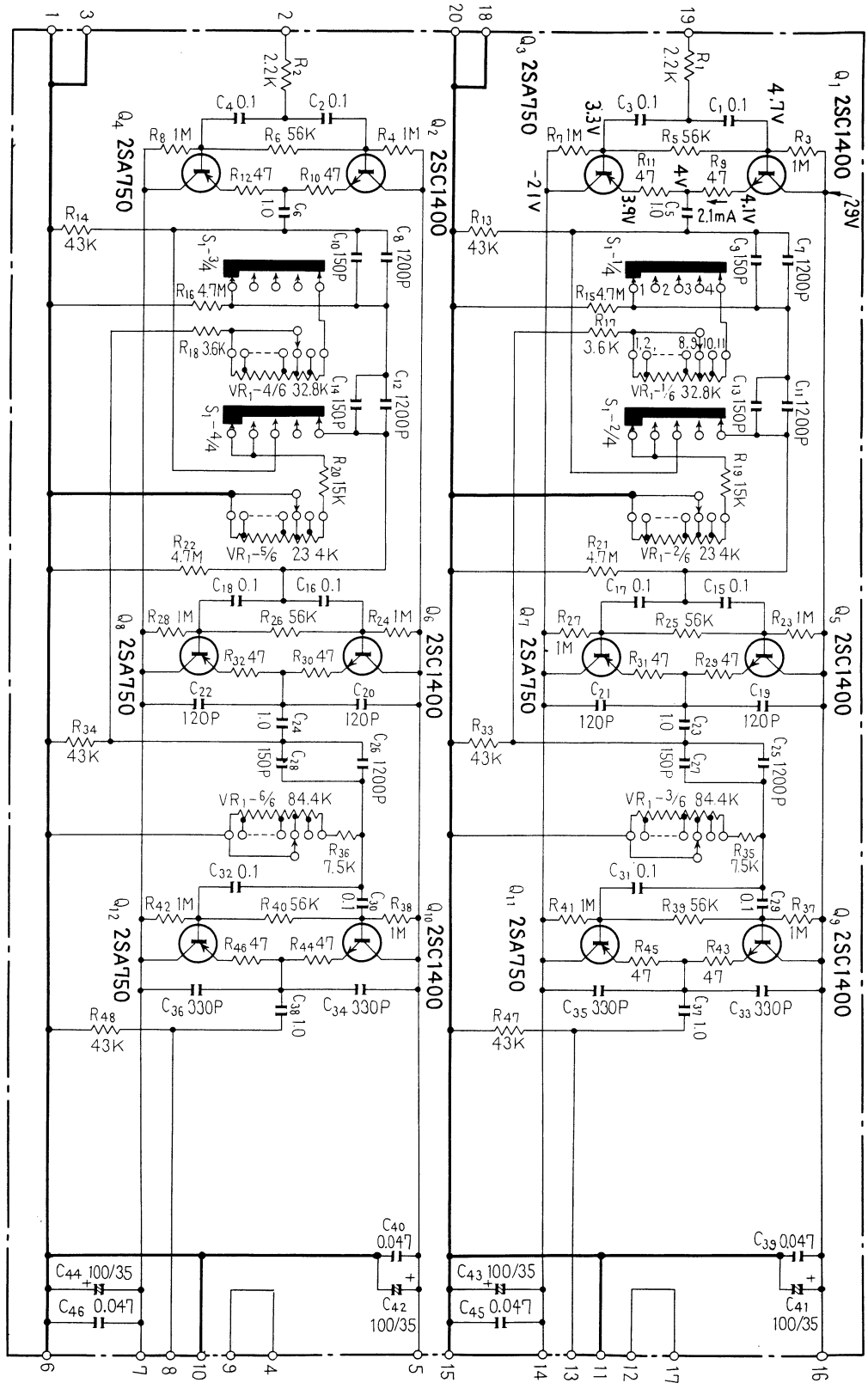
OTHERS

Symbol	Description	Part No.
	3P Plug	AKM-033
	4P Plug	AKM-034
	Nut M9	ABN-024
	Nut M7	B71-010
	Washer M7	B22-018
	Clip	AEC-311

List of Changed Parts for Factory Modification

Symbol	Description	Part No.

9.7 H.P.F. AMPLIFIER ASSEMBLY (AWM-100)



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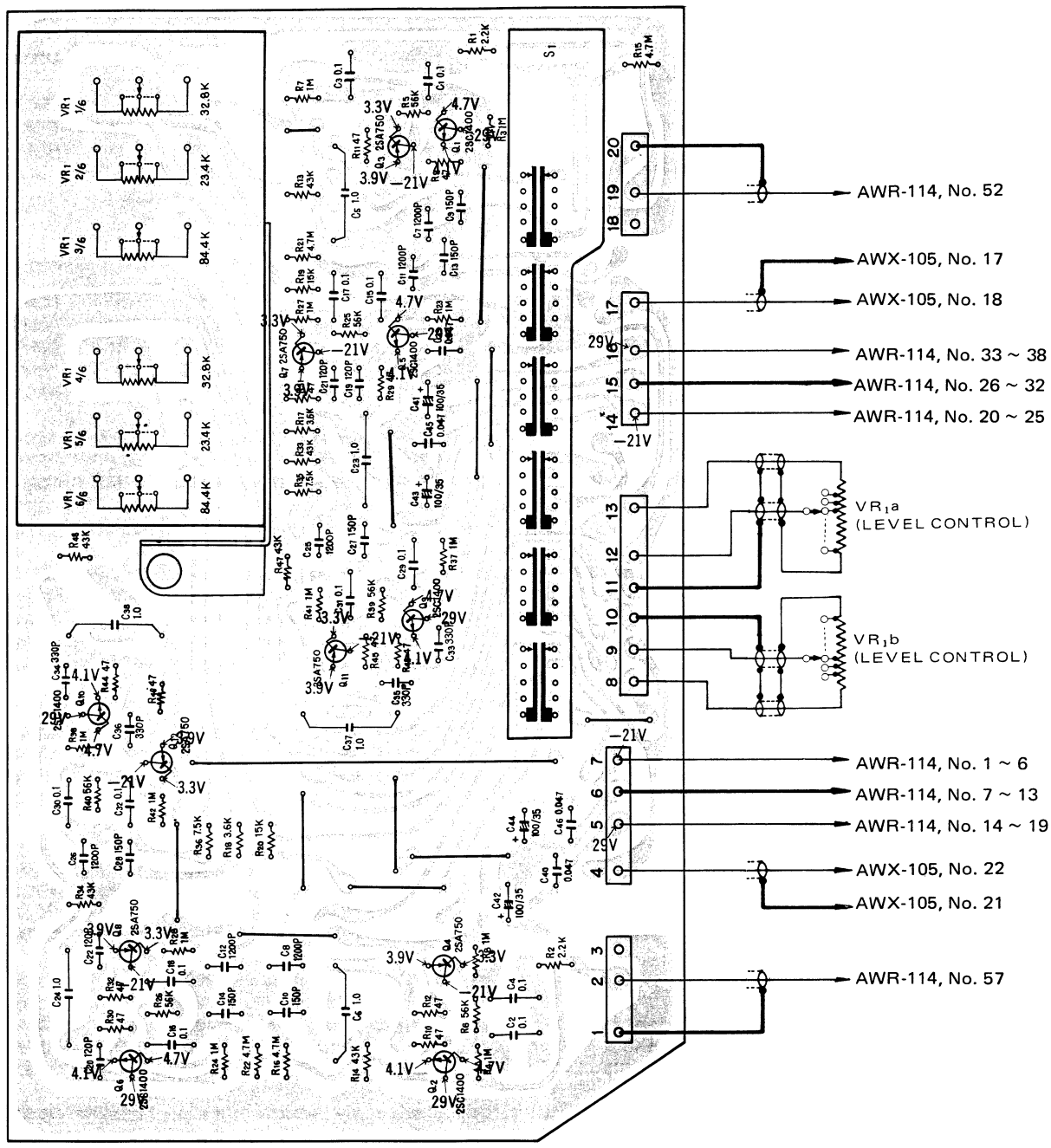
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AWX-105, No. 17
AWX-105, No. 18
AWR-114, No. 33 ~ 38
AWR-114, No. 26 ~ 32
AWR-114, No. 20 ~ 25
VR1a (LEVEL CONTROL)
VR1b (LEVEL CONTROL)
AWR-114, No. 1 ~ 6
AWR-114, No. 7 ~ 13
AWR-114, No. 14 ~ 19
AWX-105, No. 22
AWX-105, No. 21
AWR-114, No. 57

Parts List of H.P.F. Amplifier Assembly (AWM-100)

SWITCH

Symbol	Description	Part No.
S1	Rotary switch (SLOPE)	ASD-060

RESISTORS

Symbol	Description		Part No.
VR1	Variable resistor (CROSSOVER)		ACV-602
R1	Carbon film	2.2k	RD¼VS 222J
R2	Carbon film	2.2k	RD¼VS 222J
R3	Carbon film	1M	RD¼PS 105J NL
R4	Carbon film	1M	RD¼PS 105J NL
R5	Carbon film	56k	RD¼VS 563J
R6	Carbon film	56k	RD¼VS 563J
R7	Carbon film	1M	RD¼PS 105J NL
R8	Carbon film	1M	RD¼PS 105J NL
R9	Carbon film	47	RD¼VS 470J
R10	Carbon film	47	RD¼VS 470J
R11	Carbon film	47	RD¼VS 470J
R12	Carbon film	47	RD¼VS 470J
R13	Carbon film	43k	RD¼VS 433J
R14	Carbon film	43k	RD¼VS 433J
R15	Carbon film	4.7M	RD¼VS 475J
R16	Carbon film	4.7M	RD¼VS 475J
R17	Carbon film	3.6k	RD¼VS 362J
R18	Carbon film	3.6k	RD¼VS 362J
R19	Carbon film	15k	RD¼VS 153J
R20	Carbon film	15k	RD¼VS 153J
R21	Carbon film	4.7M	RD¼VS 475J
R22	Carbon film	4.7M	RD¼VS 475J
R23	Carbon film	1M	RD¼PS 105J NL
R24	Carbon film	1M	RD¼PS 105J NL
R25	Carbon film	56k	RD¼VS 563J
R26	Carbon film	56k	RD¼VS 563J
R27	Carbon film	1M	RD¼PS 105J NL
R28	Carbon film	1M	RD¼PS 105J NL
R29	Carbon film	47	RD¼VS 470J
R30	Carbon film	47	RD¼VS 470J
R31	Carbon film	47	RD¼VS 470J
R32	Carbon film	47	RD¼VS 470J
R33	Carbon film	43k	RD¼VS 433J
R34	Carbon film	43k	RD¼VS 433J
R35	Carbon film	7.5k	RD¼VS 752J
R36	Carbon film	7.5k	RD¼VS 752J
R37	Carbon film	1M	RD¼PS 105J NL
R38	Carbon film	1M	RD¼PS 105J NL
R39	Carbon film	56k	RD¼VS 563J
R40	Carbon film	56k	RD¼VS 563J
R41	Carbon film	1M	RD¼PS 105J NL
R42	Carbon film	1M	RD¼PS 105J NL
R43	Carbon film	47	RD¼VS 470J
R44	Carbon film	47	RD¼VS 470J
R45	Carbon film	47	RD¼VS 470J
R46	Carbon film	47	RD¼VS 470J
R47	Carbon film	43k	RD¼VS 433J
R48	Carbon film	43k	RD¼VS 433J

CAPACITORS

Symbol	Description			Part No.
C1	Mylar	0.1	50V	CQMA 104J 50
C2	Mylar	0.1	50V	CQMA 104J 50
C3	Mylar	0.1	50V	CQMA 104J 50
C5	Mylar	0.1	50V	CQMA 104J 50
C5	Metallized mylar	1	100V	AEC-008
C6	Metallized mylar	1	100V	AEC-008
C7	Polypropylene	1200p	50V	CQPA 122G 50
C8	Polypropylene	1200p	50V	CQPA 122G 50
C9	Polystylene	150p	50V	CQSA 151J 50
C10	Polystylene	150p	50V	CQSA 151J 50
C11	Polypropylene	1200p	50V	CQPA 122G 50
C12	Polypropylene	1200p	50V	CQPA 122G 50
C13	Polystyrene	150p	50V	CQSA 151J 50
C14	Polystyrene	150p	50V	CQSA 151J 50
C15	Mylar	0.1	50V	CQMA 104J 50
C16	Mylar	0.1	50V	CQMA 104J 50
C17	Mylar	0.1	50V	CQMA 104J 50
C18	Mylar	0.1	50V	CQMA 104J 50
C19	Polystyrene	120p	50V	CQSA 121K 50
C20	Polystyrene	120p	50V	CQSA 121K 50
C21	Polystyrene	120p	50V	CQSA 121K 50
C22	Polystyrene	120p	50V	CQSA 121K 50
C23	Metallized mylar	1	100V	AEC-008
C24	Metallized mylar	1	100V	AEC-008
C25	Polypropylene	1200p	50V	CQPA 122G 50
C26	Polypropylene	1200p	50V	CQPA 122G 50
C27	Polystyrene	150p	50V	CQSA 151J 50
C28	Polystyrene	150p	50V	CQSA 151J 50
C29	Mylar	0.1	50V	CQMA 104J 50
C30	Mylar	0.1	50V	CQMA 104J 50
C31	Mylar	0.1	50V	CQMA 104J 50
C32	Mylar	0.1	50V	CQMA 104J 50
C33	Polystyrene	330p	50V	CQSA 331J 50
C34	Polystyrene	330p	50V	CQSA 331J 50
C35	Polystyrene	330p	50V	CQSA 331J 50

Symbol	Description			Part No.
C36	Polystyrene	330p	50V	CQSA 331J 50
C37	Metallized mylar	1	100V	AEC-008
C38	Metallized mylar	1	100V	AEC-008
C39	Mylar	0.047	50V	CQMA 473J 50
C40	Mylar	0.047	50V	CQMA 473J 50
C41	Electrolytic	100	35V	CEA 101P 35
C42	Electrolytic	100	35V	CEA 101P 35
C43	Electrolytic	100	35V	CEA 101P 35
C44	Electrolytic	100	35V	CEA 101P 35
C45	Mylar	0.047	50V	CQMA 473J 50
C46	Mylar	0.047	50V	CQMA 473J 50

SEMICONDUCTORS

Symbol	Description	Part No.
Q1	Transistor	2SC1400-E
Q2	Transistor	2SC1400-E
Q3	Transistor	2SA750-E
Q4	Transistor	2SA750-E
Q5	Transistor	2SC1400-E
Q6	Transistor	2SC1400-E
Q7	Transistor	2SA750-E
Q8	Transistor	2SA750-E
Q9	Transistor	2SC1400-E
Q10	Transistor	2SC1400-E
Q11	Transistor	2SA750-E
Q12	Transistor	2SA750-E

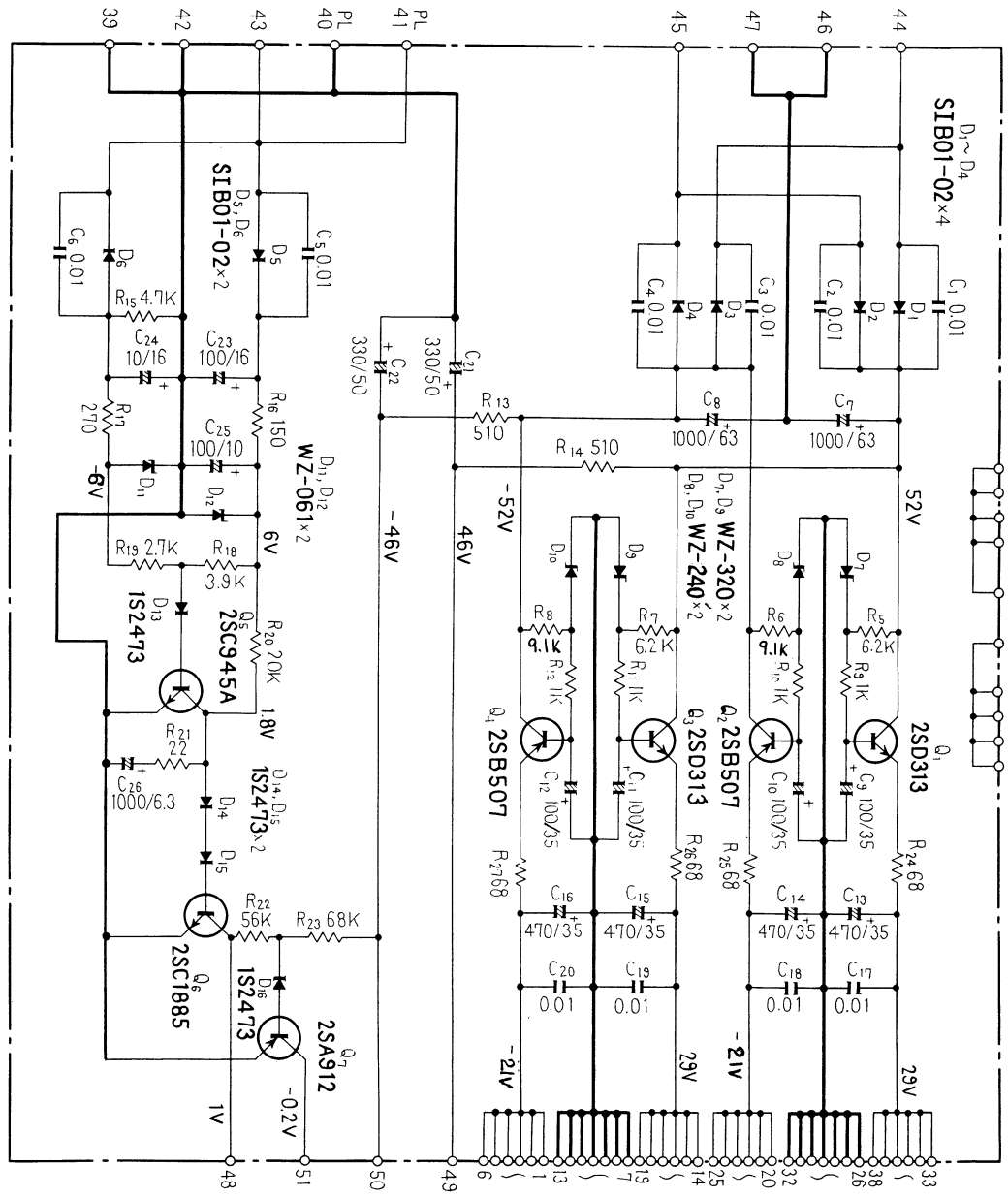
OTHERS

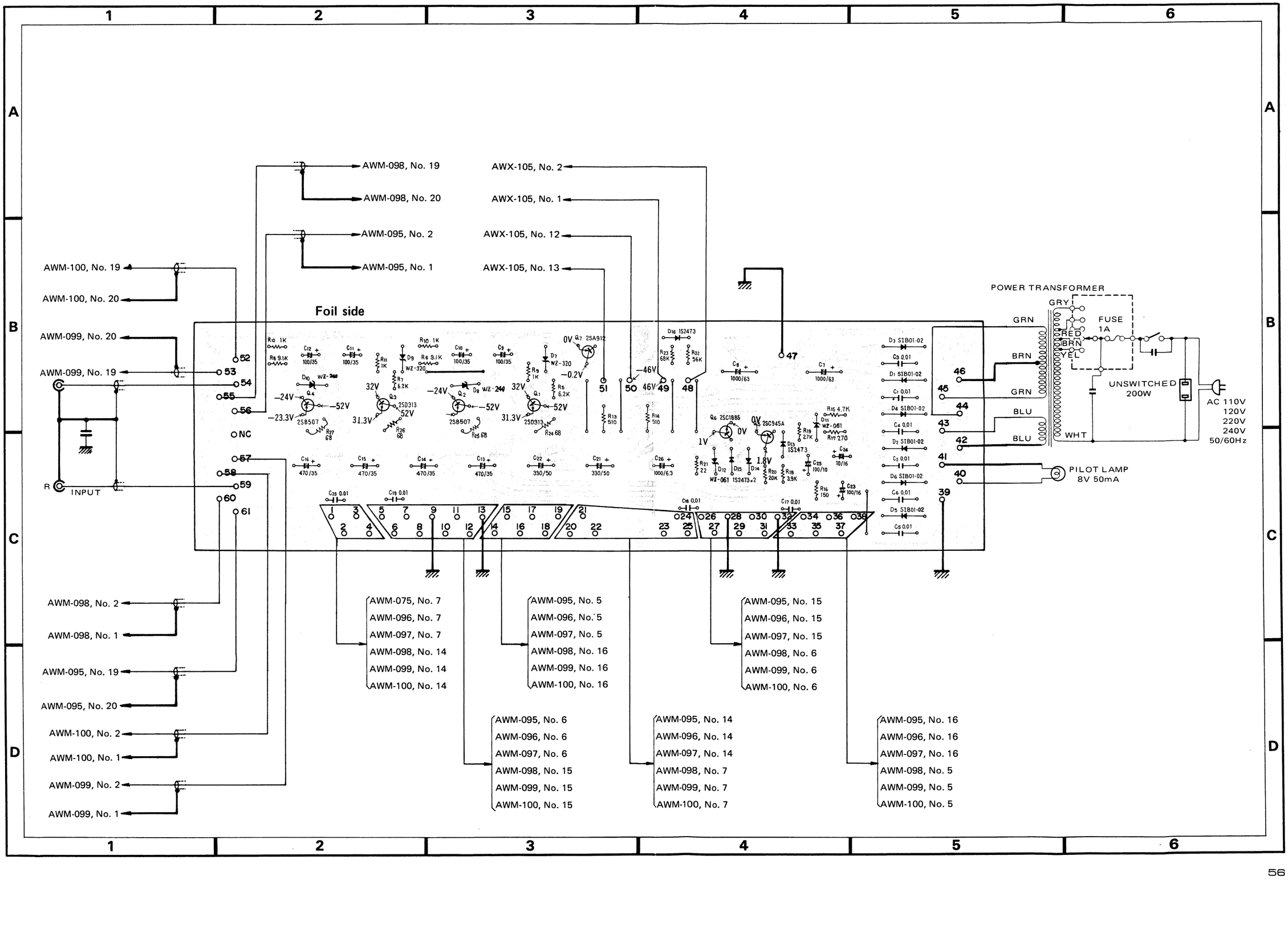
Symbol	Description	Part No.
	3P Plug	AKM-033
	4P Plug	AKM-034
	6P Plug	AKM-036
	Clip	AEC-311
	Nut M9	ABN-024
	Nut M7	B71-010
	Washer M7	B22-018

List of Changed Parts for Factory Modification

Symbol	Description	Part No.

9.8 POWER SUPPLY ASSEMBLY (AWR-114)

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AWM-095, No. 2
AWM-095, No. 1
AWX-105, No. 2
AWX-105, No. 1
AWX-105, No. 12
AWX-105, No. 13
AWM-100, No. 19
AWM-100, No. 20
AWM-099, No. 20
AWM-099, No. 19
Foil side
POWER TRANSFORMER
GRY
RED
BRN
YEL
GRN
BRN
GRN
BLU
BLU
WHT
FUSE
1A
UNSWITCHED
200W
AC 110V
120V
220V
240V
50/60Hz
PILOT LAMP
8V 50mA
NC
INPUT
AWM-098, No. 2
AWM-098, No. 1
AWM-095, No. 19
AWM-095, No. 20
AWM-100, No. 2
AWM-100, No. 1
AWM-099, No. 2
AWM-099, No. 1
AWM-075, No. 7
AWM-096, No. 7
AWM-097, No. 7
AWM-098, No. 14
AWM-099, No. 14
AWM-100, No. 14
AWM-095, No. 5
AWM-096, No. 5
AWM-097, No. 5
AWM-098, No. 16
AWM-099, No. 16
AWM-100, No. 16
AWM-095, No. 15
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AWM-098, No. 15
AWM-099, No. 15
AWM-100, No. 15
AWM-095, No. 14
AWM-096, No. 14
AWM-097, No. 14
AWM-098, No. 7
AWM-099, No. 7
AWM-100, No. 7
AWM-095, No. 16
AWM-096, No. 16
AWM-097, No. 16
AWM-098, No. 5
AWM-099, No. 5
AWM-100, No. 5

Parts List of Power Supply Assembly (AWR-114)

RESISTORS

Symbol	Description		Part No.
R1	.....	.....	.....
R2	.....	.....	.....
R3	.....	.....	.....
R4	.....	.....	.....
R5	Carbon film	6.2k	RD¼VS 622J
R6	Carbon film	9.1k	RD¼VS 922J
R7	Carbon film	6.2k	RD¼VS 622J
R8	Carbon film	9.1k	RD¼VS 922J
R9	Carbon film	1k	RD¼VS 102J
R10	Carbon film	1k	RD¼VS 102J
R11	Carbon film	1k	RD¼VS 102J
R12	Carbon film	1k	RD¼VS 102J
R13	Carbon film	510	RD¼VS 511J
R14	Carbon film	510	RD¼VS 511J
R15	Carbon film	4.7k	RD¼VS 472J
R16	Carbon film	150	RD¼VS 151J
R17	Carbon film	270	RD¼VS 271J
R18	Carbon film	3.9k	RD¼VS 392J
R19	Carbon film	2.7k	RD¼VS 272J
R20	Carbon film	20k	RD¼VS 203J
R21	Carbon film	22	RD¼VS 220J
R22	Carbon film	56k	RD¼VS 563J
R23	Carbon film	68k	RD¼VS 683J
R24	Carbon film	68	RD¼VS 680J
R25	Carbon film	68	RD¼VS 680J
R26	Carbon film	68	RD¼VS 680J
R27	Carbon film	68	RD¼VS 680J

CAPACITORS

Symbol	Description			Part No.
C1	Ceramic	0.01	150V	ACG-004
C2	Ceramic	0.01	150V	ACG-004
C3	Ceramic	0.01	150V	ACG-004
C4	Ceramic	0.01	150V	ACG-004
C5	Ceramic	0.01	150V	ACG-004
C6	Ceramic	0.01	150V	ACG-004
C7	Electrolytic	1,000	63V	ACH-066
C8	Electrolytic	1,000	63V	ACH-066
C9	Electrolytic	100	35V	CEA 101P 35
C10	Electrolytic	100	35V	CEA 101P 35
C11	Electrolytic	100	35V	CEA 101P 35
C12	Electrolytic	100	35V	CEA 101P 35
C13	Electrolytic	470	35V	CEA 471P 35
C14	Electrolytic	470	35V	CEA 471P 35
C15	Electrolytic	470	35V	CEA 471P 35
C16	Electrolytic	470	35V	CEA 471P 35
C17	Ceramic	0.01	50V	CKDYF 103Z 50
C18	Ceramic	0.01	50V	CKDYF 103Z 50
C19	Ceramic	0.01	50V	CKDYF 103Z 50
C20	Ceramic	0.01	50V	CKDYF 103Z 50
C21	Electrolytic	330	50V	CEA 331P 50
C22	Electrolytic	330	50V	CEA 331P 50
C23	Electrolytic	100	16V	CEA 101P 16
C24	Electrolytic	10	16V	CEA 100P 16
C25	Electrolytic	100	10V	CEA 101P 10
C26	Electrolytic	1,000	6.3V	CEA 102P 6R3

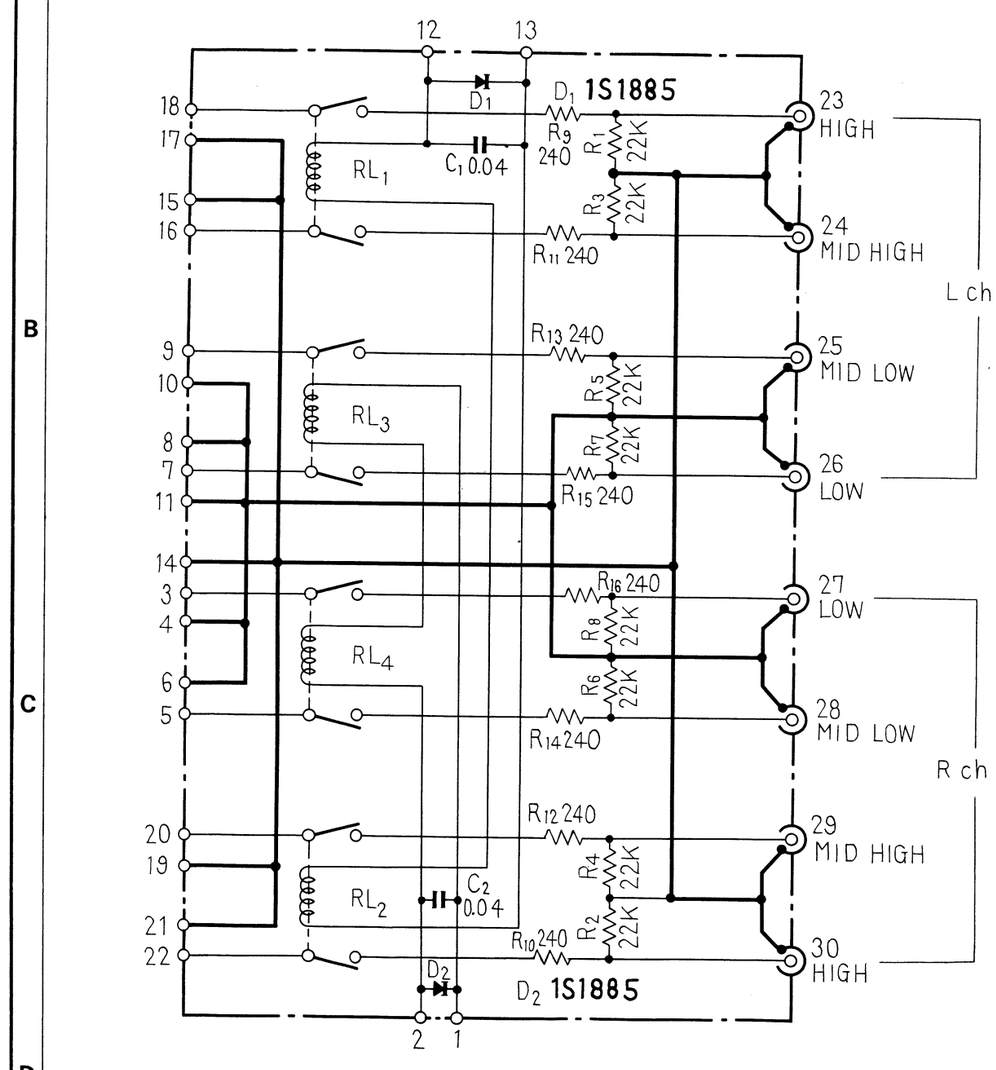
SEMICONDUCTORS

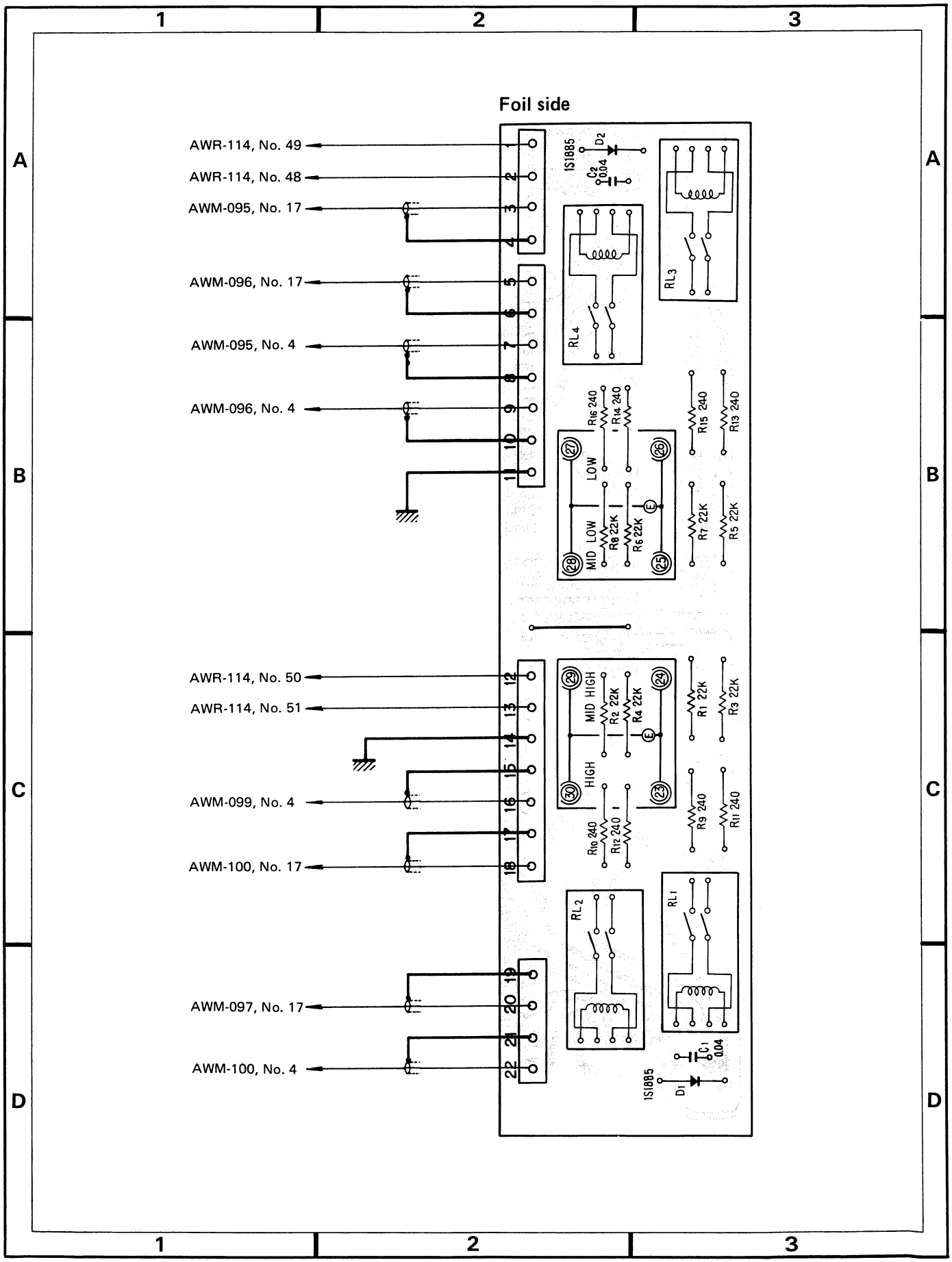
Symbol	Description	Part No.
Q1	Transistor	2SD313-D or E (2SD526-O or R)
Q2	Transistor	2SB507-O or E (2SB596-O or R)
Q3	Transistor	2SD313-D or E (2SD526-O or R)
Q4	Transistor	2SB507-O or E (2SB596-O or R)
Q5	Transistor	2SC945A-Q or P
Q6	Transistor	2SC1885-S
Q7	Transistor	2SA912-R or S
D1	Diode	SIB01-02 (1S1886)
D2	Diode	SIB01-02 (1S1886)
D3	Diode	SIB01-02 (1S1886)
D4	Diode	SIB01-02 (1S1886)
D5	Diode	SIB01-02 (1S1886)
D6	Diode	SIB01-02 (1S1886)
D7	Zener diode	WZ-320
D8	Zener diode	WZ-240
D9	Zener diode	WZ-320
D10	Zener diode	WZ-240
D11	Zener diode	WZ-061
D12	Zener diode	WZ-061
D13	Diode	1S2473 (1S1555)
D14	Diode	1S2473 (1S1555)
D15	Diode	1S2473 (1S1555)
D16	Diode	1S2473 (1S1555)

OTHER

Symbol	Description	Part No.
	Heat sink	ANH-117

9.9 RELAY ASSEMBLY (AWX-105)




1
2
3
A
B
C
D
Foil side
AWR-114, No. 49
AWR-114, No. 48
AWM-095, No. 17
AWM-096, No. 17
AWM-095, No. 4
AWM-096, No. 4
AWR-114, No. 50
AWR-114, No. 51
AWM-099, No. 4
AWM-100, No. 17
AWM-097, No. 17
AWM-100, No. 4
1S1885
D2
C2 0.04
RL3
RL4
R16 240
R14 240
R15 240
R13 240
LOW
MID LOW
R8 22K
R6 22K
R7 22K
R5 22K
MID HIGH
HIGH
R2 22K
R4 22K
R1 22K
R3 22K
R10 240
R12 240
R9 240
R11 240
RL2
RL1
C1 0.04
1S1885
D1

Parts List of Relay Assembly (AWX-105)

SWITCHES

Symbol	Description	Part No.
RL1	Reed relay	ASR-005
RL2	Reed relay	ASR-005
RL3	Reed relay	ASR-005
RL4	Reed relay	ASR-005

RESISTORS

Symbol	Description		Part No.
R1	Carbon film	22k	RD¼PS 223J
R2	Carbon film	22k	RD¼PS 223J
R3	Carbon film	22k	RD¼PS 223J
R4	Carbon film	22k	RD¼PS 223J
R5	Carbon film	22k	RD¼PS 223J
R6	Carbon film	22k	RD¼PS 223J
R7	Carbon film	22k	RD¼PS 223J
R8	Carbon film	22k	RD¼PS 223J
R8	Carbon film	22k	RD¼PS 223J
R9	Carbon film	240	RD¼PS 241J
R10	Carbon film	240	RD¼PS 241J
R11	Carbon film	240	RD¼PS 241J
R12	Carbon film	240	RD¼PS 241J
R13	Carbon film	240	RD¼PS 241J
R14	Carbon film	240	RD¼PS 241J
R15	Carbon film	240	RD¼PS 241J
R16	Carbon film	240	RD¼PS 241J

CAPACITORS

Symbol	Description			Part No.
C1	Ceramic	0.04	50V	CKDYF 403Z 50
C2	Ceramic	0.04	50V	CKDYF 403Z 50

SEMICONDUCTORS

Symbol	Description	Part No.
D1	Diode	1S1885
D2	Diode	1S1885

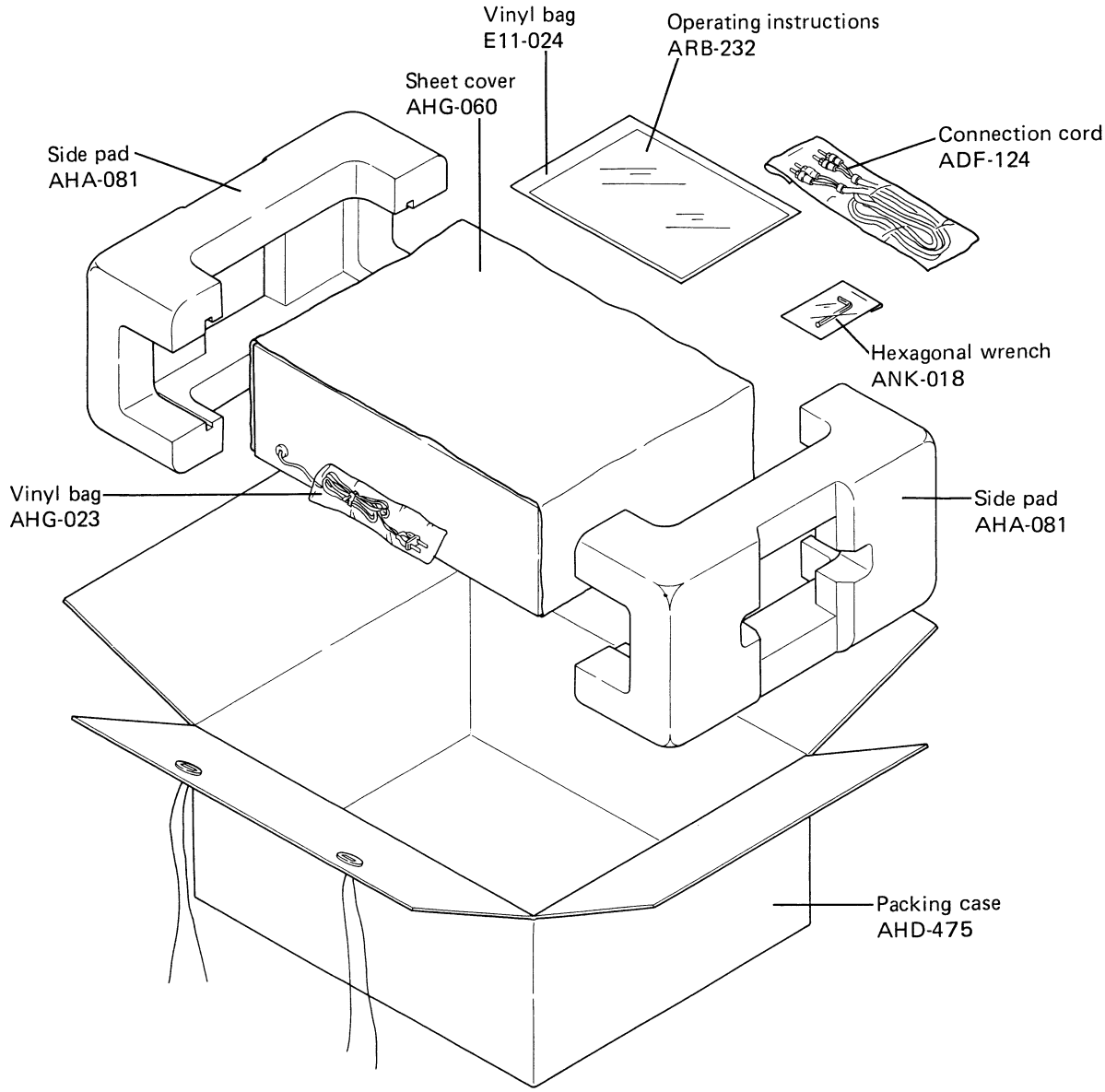
OTHER

Symbol	Description	Part No.
	4P terminal (OUTPUT)	AKB-023

List of Changed Parts for Factory Modification

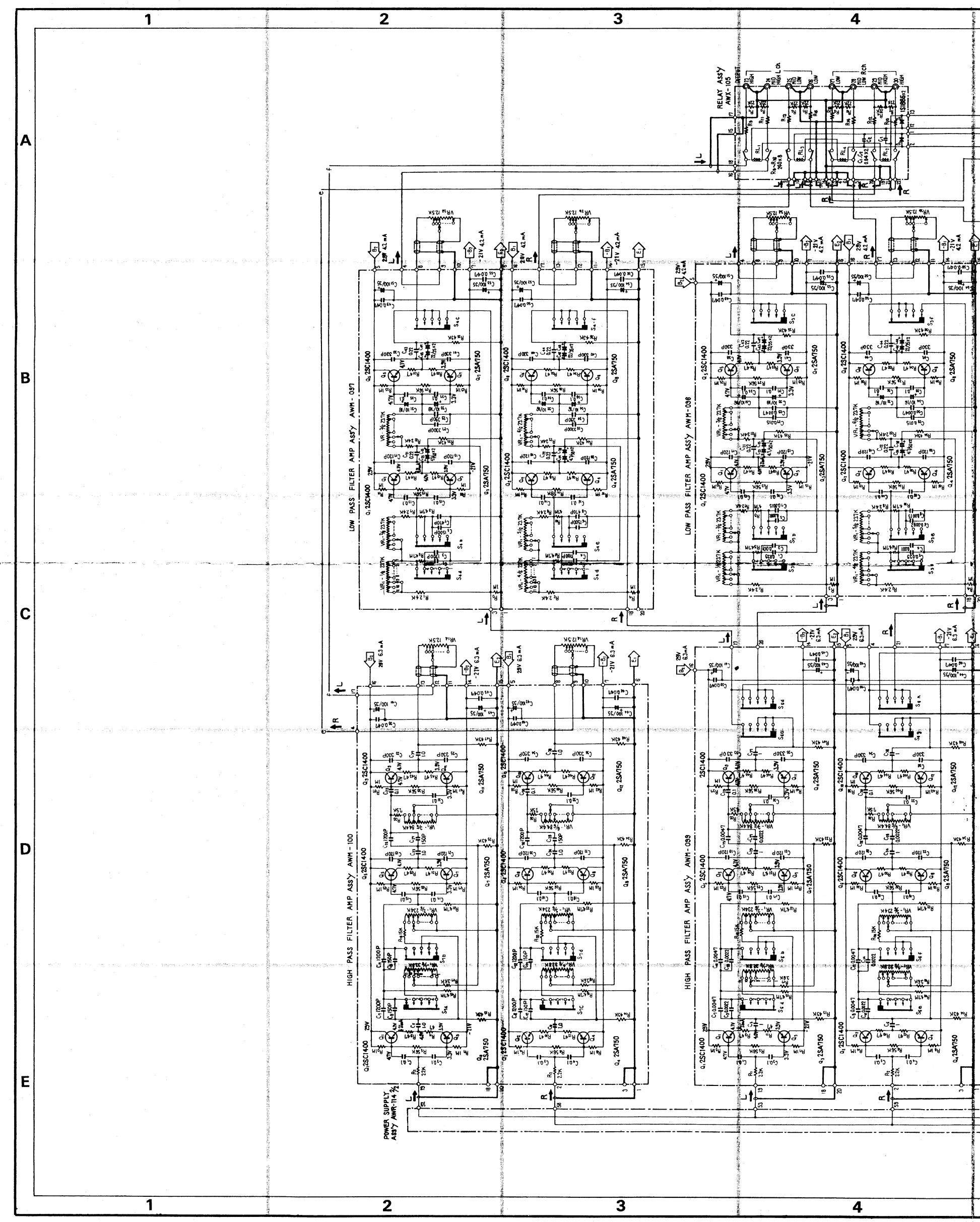
Symbol	Description	Part No.

10. PACKING

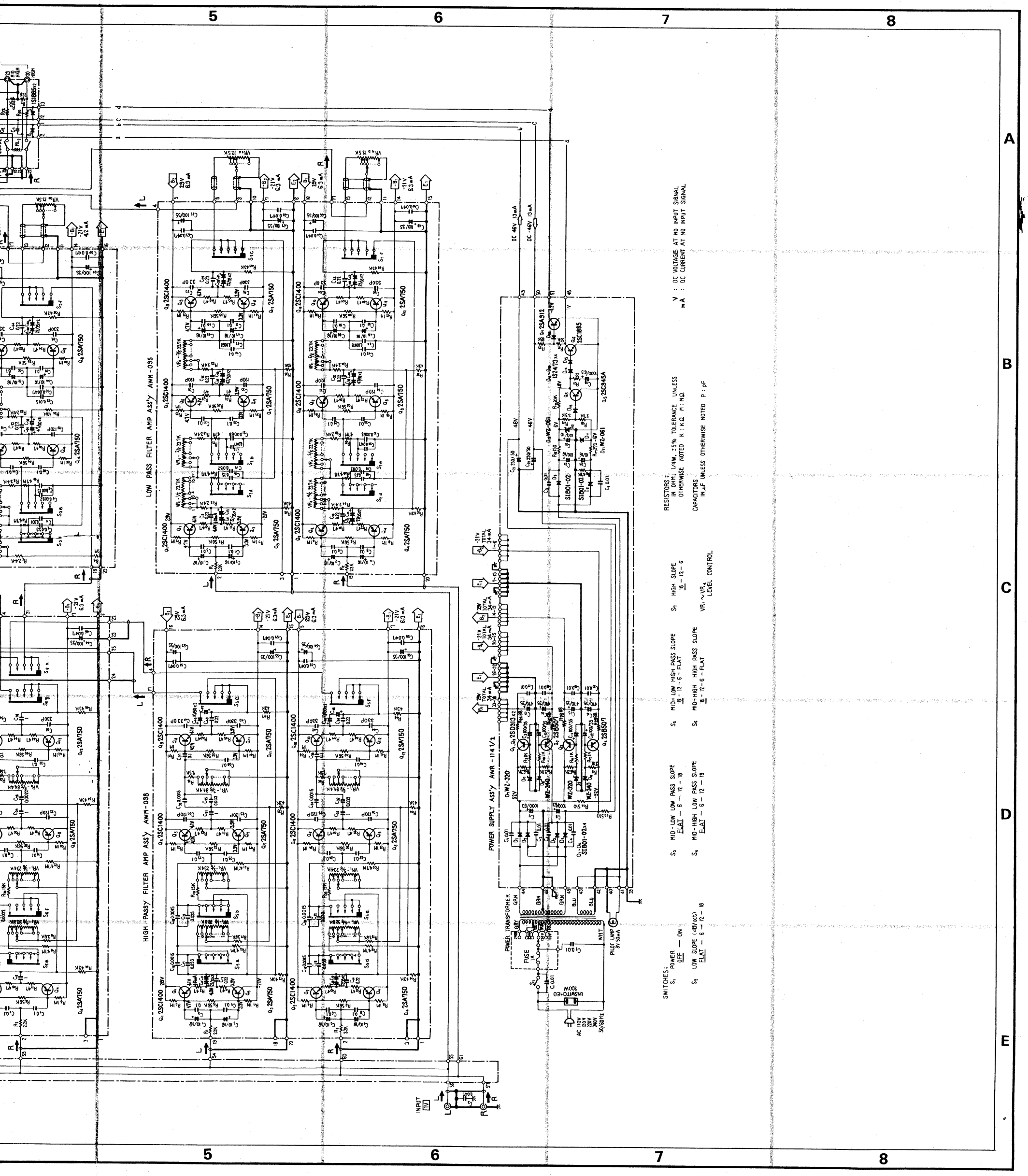

Vinyl bag
E11-024
Operating instructions
ARB-232
Sheet cover
AHG-060
Side pad
AHA-081
Connection cord
ADF-124
Hexagonal wrench
ANK-018
Vinyl bag
AHG-023
Side pad
AHA-081
Packing case
AHD-475

ELECTRONIC CROSSOVER NETWORK

D-23 SL



PIONEER


5
6
7
8
A
B
C
D
E
HIGH PASS FILTER AMP ASS'y AWM-038
LOW PASS FILTER AMP ASS'y AWM-035
POWER SUPPLY ASS'y AWR-1141/2
V : DC VOLTAGE AT NO INPUT SIGNAL
mA : DC CURRENT AT NO INPUT SIGNAL
RESISTORS ; IN OHM; 1/4W. ±5% TOLERANCE UNLESS OTHERWISE NOTED K : KΩ M : MΩ
CAPACITORS IN μF UNLESS OTHERWISE NOTED P : pF
S1 MID-LOW LOW PASS SLOPE FLAT — 6 — 12 — 18
S2 MID-HIGH LOW PASS SLOPE FLAT — 6 — 12 — 18
S3 MID-LOW HIGH PASS SLOPE 18 — 12 — 6 — FLAT
S4 MID-HIGH HIGH PASS SLOPE 18 — 12 — 6 — FLAT
S5 HIGH SLOPE 18 — 12 — 6
VR1 ~ VR4 LEVEL CONTROL
SWITCHES; S1 POWER OFF — ON
S2 LOW SLOPE (dB/oct) FLAT — 6 — 12 — 18
INPUT 1V
POWER TRANSFORMER
FUSE 1A
PILOT LAMP 8V 50mA
AC 110V 120V 220V 240V 50/60Hz